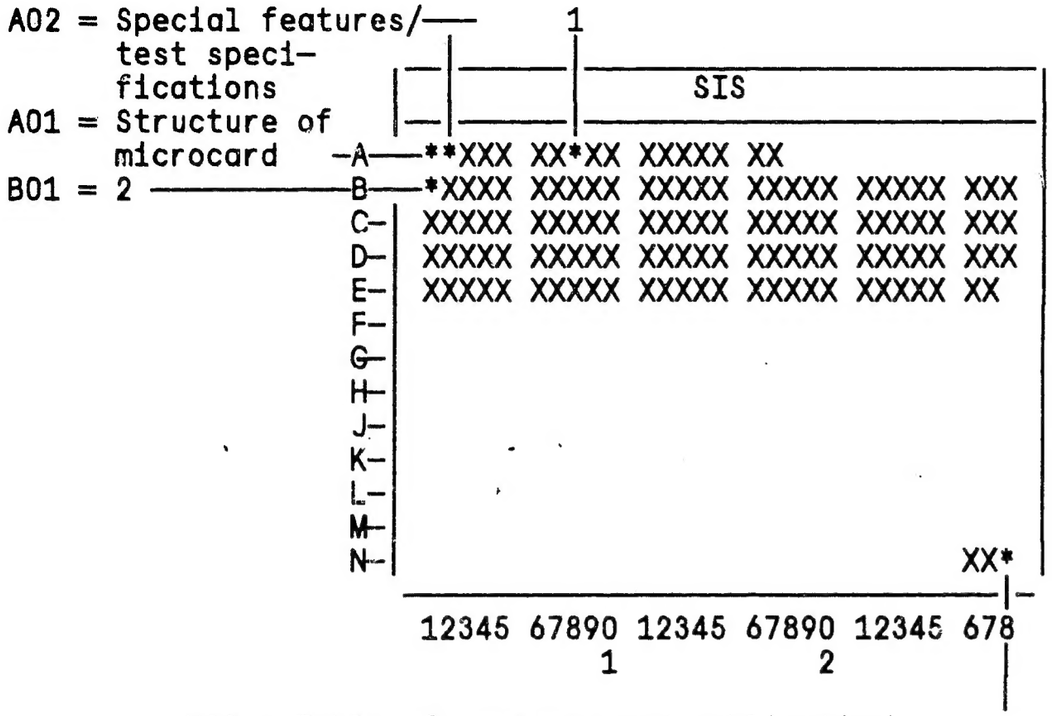
STRUCTURE OF THE MICROCARD

A02 = Special features/test specifications
A01 = Structure of microcard
B01 = 2



N28 = Table of contents and publication information
1 = Tools and devices
2 = Complete instructions, divided into test steps (no references)

a. Read from left to right.

b. Title of micropicture (appears on each coordinate).

E16	Product/component/test step	

Coordinate

c. Limits of section

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Beginning	Mid-section	End	One-page section

TEST BENCHES, TEST EQUIPMENT AND INFORMATION ON HOW TO TEST FUEL-INJECTION PUMPS

1.1 General

1.2 Test specifications

The test specifications for fuel-injection equipment are contained in the test specifications as outlined in the Microcards WP.. (Table of Contents WP-00 or WP-01).
General test specifications for governors and timing devices are listed in the Microcards WP-451 to WP-453.

1.3 CALIBRATING OIL

The calibrating oil must be in line with the specifications of ISO Standard 4113. It must not be mixed with lubricating oil or diesel fuel, and it must not be in any way contaminated as this would influence the test specifications. It is also not permissible to mix ISO calibrating oils from various manufacturers, in the same way as the addition of kerosine or diesel fuel is not permitted. The prescribed calibrating-oil temperature for in-line pumps is 38...42° C in the inlet; for distributor-type pumps of types VA and M the temperature is 40...45° in the inlet.

Temperature measurement in the return is prescribed for distributor-type fuel-injection pumps.
When using the temperature indicator 1 687 230 029, the following applies:
40...48° C
When using a temperature sensor with electrical display, the following applies:
42...50° C.

Viscosity test:

Tester KDEP 1500 comprising:
* Vessel with cover
* Thermometer with protective conduit and holder
* Viscosity cup
* Stopwatch (not included in scope of delivery).

Test intervals (depending on degree of utilization of test bench)

* 1x per week (as per ISO Specification 4008/III)
* At the latest after testing 20 fuel-injection pumps or after approx. 35 hours of operation.
* However not later than after six months, if in the meantime no or less than 20 fuel-injection pumps have been tested.

Preparation

Fill (roughly 3/4) vessel with filtered calibrating oil from inlet line of test bench. Utmost cleanliness is to be observed. Even minute dust particles (e.g. fluff in the vessel) bias the measurement result.

Secure thermometer with protective conduit to inside of vessel. Immerse viscosity cup in calibrating oil and leave it to stand in calibrating oil for roughly 15 minutes. This makes for temperature equalization between the viscosity cup and calibrating oil.

Test procedure

Use chain to pull viscosity cup briskly (within approximately 1 second) out of the calibrating oil (do not swing to and fro, keep steady, avoid spillage).
Start stopwatch when viscosity cup emerges from calibrating oil.
If calibrating oil enters the inside of the cup bore from the funnel-shaped part of the cup, press stopwatch again, read off efflux time and note it down. Repeat viscosity test until same measurement result (tolerance $\pm$ 0.3 mm ^{3} /s) is attained.
If an identical result is not obtained after the fourth repetition, then the viscosity cup, the vessel or the calibrating oil (filter in test bench) is dirty (e.g. fluff). Refer to section entitled "Preparation". The test is then to be repeated again as described. Compare measurement result to values given in table.

Oil temperature (in ° C)	Permissible efflux time (sec.)
10	82.0 – 89.5
11	81.0 – 88.5
12	80.5 – 87.5
13	80.0 – 86.5
14	79.0 – 86.0
15	78.5 – 85.0
16	78.0 – 84.0
17	77.5 – 83.0
18	77.0 – 82.0
19	76.5 – 81.5
20	75.5 – 80.5
21	75.0 – 79.5
22	74.5 – 79.0
23	74.0 – 78.0
24	73.5 – 77.5
25	73.0 – 77.0
26	72.5 – 76.0
27	72.0 – 75.5
28	71.5 – 75.0
29	71.0 – 74.5
30	70.5 – 74.0
31	70.0 – 73.5

Viscosity test (continued)

Oil temperature (in ° C)	Permissible efflux time (sec.)
32	69.5 – 73.0
33	69.0 – 72.5
34	68.5 – 72.0
35	68.2 – 71.5
36	67.8 – 71.0
37	67.5 – 70.5
38	67.0 – 70.0
39	66.5 – 69.5
40	66.0 – 69.0

If the time measured is outside the permitted efflux-time tolerance, the calibrating oil and the calibrating-oil filter in the injection-pump test bench are to be changed.

Cleaning of viscosity cup
Do not clean inside of viscosity cup by polishing it, but rather wash it out after each test with benzine, so as to avoid resin residues in the efflux hole.

N e v e r clean efflux hole with a needle, since scoring in the hole would bias the measurement result by altering the flow conditions.

1.4 Condition of test equipment

The injection pressure of the calibrating nozzle-holder assemblies and the condition of the nipples of the test fuel-injection tubing (use gauge plug) are to be checked once a week, or at the latest after testing 20 fuel-injection pumps!

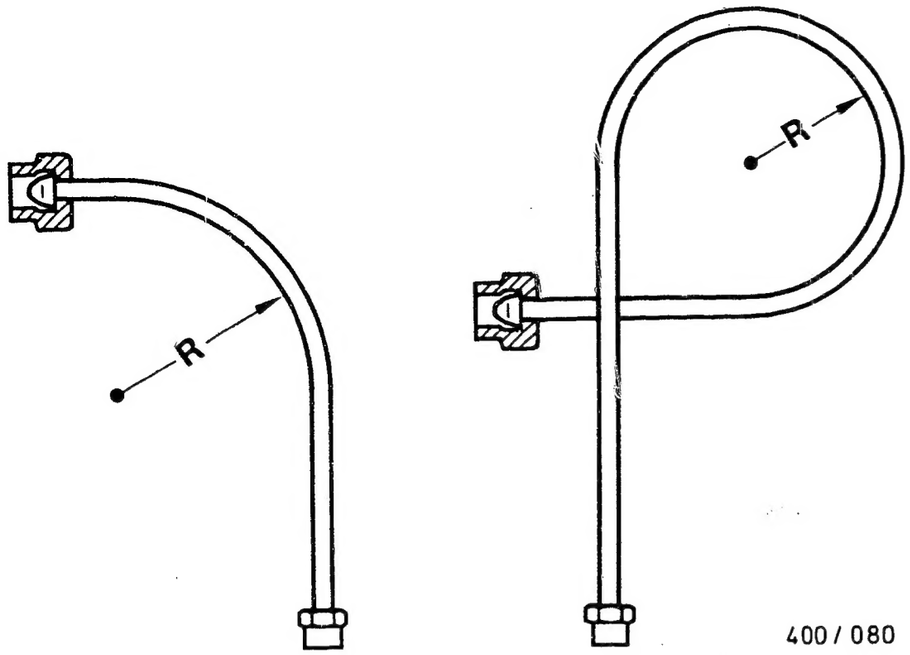
If necessary, adjust opening pressure of nozzle-holder assemblies and repair/renew fuel-injection tubing.

1.5 Configuration of test equipment

The settings and check values given in the test specifications refer to a precisely defined set of test equipment which is prescribed for each pump. The most important components of the test equipment are as follows: Calibrating nozzle-holder assembly and calibrating fuel-injection tubing.
Possible variations on such test equipment are listed as of Coordinate A13 where they are arranged according to pump type. Indicated first in each case are the calibrating fuel-injection tubing and calibrating nozzle-holder assemblies prescribed for the type of pump concerned. (Not stated on older test-specification sheets).
This is then followed by other test-equipment possibilities.

1.6 Pump test bench

The test equipment also features a list of the test benches permitted for each pump size. Non-observance of these specifications will result in extremely incorrect settings or wrong test results.
Non-listed types of test bench are not permissible!



Min. perm. bending radii for calibrating fuel-injection tubing:

O.D. mm	Wall thickness mm	Radius R mm
6	2.0	16
6	1.5	25
8	2.5	50
8	2.0	50

In order to avoid vibration, use is to be made of the tubing holder, part no. 1 682 386 002, in the case of tubing lengths as of 600 mm.

1.7 Test conditions

In order to be able to obtain the prescribed values when adjusting/checking pumps, the test conditions listed on the test-specification sheet for the various pump sizes are to be strictly adhered to. This applies in particular to the supply pressure and, if stated, to the special overflow valve for flushing the suction gallery/chamber.

1.8 LPC adjustment

The following applies to all in-line pumps:

The prestroke has been reached when the flow of calibrating oil at the overflow of the calibrating nozzle-holder assembly becomes a bead of droplets.

The following applies to all distributor-type fuel-injection pumps:

* The supply pressure for all types is 0.2 bar (VM pump 0.04 bar).

* The start of delivery has been reached when 1 droplet per second flows out at the overflow.

1.9 Delivery measurement

Tne delivery stated in the test specifications is the average value for all individual quantities determined.
At the same time, it is necessary to determine whether the scatter permitted by the test specifications is being exceeded.
The scatter designates the difference in quantity between the maximum and minimum delivery.

E x a m p l e :
Prescribed delivery = 12.1...12.3 cm ^{3} /100 strokes
Permissible scatter = 0.3 cm ^{3} /100 strokes

Barrel No.	1	2	3	4	5	6	Average
Delivery	12.4	12.2	12.5	12.3	12.5	12.4	12.38

Scatter determined: 12.5...12.2 = 0.3 cm ^{3} /100 strokes
This setting is not permissible; the average value of all barrels is not between 12.1 and 12.3 cm ^{3} /100 strokes.

Barrel No.	1	2	3	4	5	6	Average
Delivery	12.4	12.2	12.0	12.3	12.1	12.4	12.23

Scatter determined: 12.4...12.0 = 0.4 cm ^{3} /100 strokes
This setting is not permissible; the scatter is more than 0.3 cm ^{3} /100 strokes.

Barrel No.	1	2	3	4	5	6	Average
Delivery	12.4	12.2	12.2	12.3	12.1	12.4	12.26

Scatter determined: 12.4...12.1 = 0.3 cm ^{3} /100 strokes
This setting is permissible.

* Always wet inside of graduates before performing measurement.
  To do so, allow calibrating oil to run in and graduates to drip off for 30 ± 1 seconds.

* After every measurement, allow graduates to empty for 30 ± 1 seconds before starting new measurement. If the pause following emptying is longer than 10 minutes, then the graduates are to be wetted again.

* The filament decoupling coil must not be switched on during measurement.
  When reading off delivery, there must be no bubbles in the graduates on the surface of the calibrating oil.
  Take reading at refraction at blue stripe on graduate.

* While taking measurement on one pump, keep calibrating-oil temperature constant within stated tolerances.

In-line pumps	38...42° C	in inlet
VA, VM pumps	40...45° C	in inlet
VE pumps		in return

40°...48° C when using temperature indicator 1 687 230 029

42°...50° C when using a temperature sensor with electr. display.

* Particular attention is to be paid to the following in the case of distr.-type fuel-inj. pumps:

  - Adhere to test sequence as stated in test instr.

  - In order to maintain calibrating oil at permitted temperature, allow for necessary cooling pauses or warm-up times.

1.10 Test benches and test equipment assigned to fuel-injection-pump versions

The respective injection-pump test benches approved for the various types of fuel-injection pump are listed in the following tables.

The inertia flywheel, intermediate flange, driving coupling and coupling half listed in the respective columns are mandatory features of the corresponding injection-pump test bench.

All other data, which are indicated after the vertical double dashed line, are to be selected in line with the information given in the test-specification sheet and are thus not assigned to the test bench in question.

For technical reasons, all information relating to a given type of pump is always listed in two consecutive tables.

The list of test benches and accessories corresponds to the current status at the time of going to press.

For production reasons: continued on the following coordinate.

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PES..M..(old version)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 5..	Series	1 685 700 143	1 686 401 031	1 686 430 022	1 417 413 012	1.0 bar	30...32	1.0
EFEP 25..	Series	1 685 700 143	1 686 401 031	1 686 430 022	(see test specs.)			
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 375..	Series	1 685 700 143	1 686 401 031	1 686 430 022				
EFEP 385..	Series	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 390..	Series	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 410..	Series	1 685 700 143	1 686 401 031	1 686 430 022				
EFEP 500..	Series	1 685 700 143	1 686 401 031	1 686 430 022				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 022				
EPS 270..	Series	1 685 700 143	1 686 401 031	1 686 430 022				
EPS 604..	Series	1 685 700 143	1 686 401 030	1 686 430 022				
EPS 704..	Series	1 685 700 143	1 686 401 030	1 686 430 022				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 022				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 022	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PES..M..(old version)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 5..	1 680 750 014	6x2.0x600 mm	M14x1.5/M12x1.5	0 681 343 009	172...175	0 681 443 014	–
EFEP 25..	V	V	V	V	V	V	–
EFEP 41..							–
EFEP 375..							–
EFEP 385..							–
EFEP 390..							–
EFEP 410..							–
EFEP 500..							–
EFEP 515..							–
EFEP 615..							–
EPS 270..							–
EPS 604..							–
EPS 704..							–
EPS 707..							–
EPS 711..							–

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PES..M..(new version)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 5..	Series	1 685 700 143	1 686 401 031	1 686 432 019	1 469 990 351	–	30...32	1.0
EFEP 25..	Series	1 685 700 143	1 686 401 031	1 686 432 019	(see test specs.)			
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 432 019				
EFEP 375..	Series	1 685 700 143	1 686 401 031	1 686 432 019				
EFEP 385..	Series	1 685 700 140	1 686 401 028	1 686 432 019				
EFEP 390..	Series	1 685 700 140	1 686 401 028	1 686 432 019				
EFEP 410..	Series	1 685 700 143	1 686 401 031	1 686 432 019				
EFEP 500..	Series	1 685 700 143	1 686 401 031	1 686 432 019				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 432 019				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 432 019				
EPS 270..	Series	1 685 700 143	1 686 401 031	1 686 432 019				
EPS 604..	Series	1 685 700 143	1 686 401 030	1 686 432 019				
EPS 704..	Series	1 685 700 143	1 686 401 030	1 686 432 019				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 432 019				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 432 019	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PES..M..(new version)

Approved injection-pump test benches	Calibrating fuel-injec. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening pressure (bar)	Calibrating nozzle	Perforated plate
EFEP 5..	1 680 750 014	6x2.0x600 mm	M14x1.5/M12x1.5	0 681 343 009	172...175	0 681 443 014	–
EFEP 25..	V	V	V	V	V	V	–
EFEP 41..							–
EFEP 375..							–
EFEP 385..							–
							–
EFEP 390..							–
EFEP 410..							–
EFEP 500..							–
EFEP 515..							–
EFEP 615..							–
							–
EPS 270..							–
EPS 604..							–
EPS 704..							–
EPS 707..							–
EPS 711..							–

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..MW..(Diameter of drive cone 17 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 5..	Series *	1 685 700 143	1 686 401 031	1 686 430 022	1 417 413 012 (see test specs.)	1.0 bar	30...32	1.0
EFEP 25..	Series *	1 685 700 143	1 686 401 031	1 686 430 022				
EFEP 41..	Series *	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 375..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 022				
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 410..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 022				
EFEP 500..	Series	1 685 700 143	1 686 401 031	1 686 430 022				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 022				
EPS 270..	Series	1 685 700 143	1 686 401 031	1 686 430 022				
EPS 604..	Series	1 685 700 143	1 686 401 030	1 686 430 022				
EPS 704..	Series	1 685 700 143	1 686 401 030	1 686 430 022				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 022				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 022	V	V	V	V

* up to PE(S) 5 MW 55..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..MW..(Diameter of drive cone 17 mm)

Approved injection-pump test benches	Calibrating fuel-injec. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 5..	1 680 750 014	6x2.0x600 mm	M14x1.5/M12x1.5	0 681 343 009	172...175	0 681 443 014	–
EFEP 25..	V	V	V	V	V	V	–
EFEP 41..							–
EFEP 375..							–
EFEP 385..							–
EFEP 390..							–
EFEP 410..							–
EFEP 500..							–
EFEP 515..							–
EFEP 615..							–
EPS 270..							–
EPS 604..							–
EPS 704..							–
EPS 707..							–
EPS 711..							–

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..MW..(Diameter of drive cone 20 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply press. (bar) Prestroke	Supply press. (bar) Delivery
EFEP 5..	Series *	1 685 700 143	1 686 401 031	1 686 430 024	1 417 413 000	1.5 bar	30...32	1.5
EFEP 25..	Series *	1 685 700 143	1 686 401 031	1 686 430 024	1 417 413 047	1.5 bar		1.5
EFEP 41..	Series *	1 685 700 140	1 686 401 028	1 686 430 024	2 417 413 037	1.5 bar		2.8
EFEP 375..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 024	(see test specs.)			
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 410..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 024				
EFEP 500..	Series	1 685 700 143	1 686 401 031	1 686 430 024				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 024				
EPS 270..	Series	1 685 700 143	1 686 401 031	1 686 430 024				
EPS 604..	Series	1 685 700 143	1 686 401 030	1 686 430 024				
EPS 704..	Series	1 685 700 143	1 686 401 030	1 686 430 024				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 024				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 024	V	V	V	V

* up to PE(S) 5 MW 55..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..MW..(Diameter of drive cone 20 mm)

Approved injection-pump test benches	Calibrating fuel-injec. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 5..	1 680 750 008	6x2.0x600 mm	M14x1.5/M14x1.5	0 681 343 009	172...175	0 681 443 014	–
EFEP 25..	1 680 750 014		M14x1.5/M12x1.5	1 688 901 016	207...210	1 688 901 999	0.5 mm
EFEP 41..				1 688 901 017			0.6 mm
EFEP 375..							–
EFEP 385..							–
							–
EFEP 390..							–
EFEP 410..							–
EFEP 500..							–
EFEP 515..							–
EFEP 615..							–
							–
EPS 270..							–
EPS 604..							–
EPS 704..							–
EPS 707..							–
EPS 711..	V	V	V	V	V	V	–

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..MW..(Diameter of drive cone 25 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 5..	Series *	1 685 700 143	1 686 401 031	1 686 430 026	1 417 413 000	1.5 bar	30...32	1.5
EFEP 25..	Series *	1 685 700 143	1 686 401 031	1 686 430 026	1 417 413 047	1.5 bar		1.5
EFEP 41..	Series *	1 685 700 143	1 686 401 028	1 686 430 026+	2 417 413 037	1.5 bar		2.8
EFEP 375..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 026	(see test specs.)			
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 026+				
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 026+				
EFEP 410..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 026				
EFEP 500..	Series	1 685 700 143	1 686 401 031	1 686 430 026				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 026+				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 026+				
EPS 270..	Series	1 685 700 143	1 686 401 031	1 686 430 026				
EPS 604..	Series	1 685 700 143	1 686 401 030	1 686 430 026				
EPS 704..	Series	1 685 700 143	1 686 401 030	1 686 430 026				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 026+				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 026+				

* up to (PE(S) 5 MW 55..
\+ or 1 686 430 030

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..MW..(Diameter of drive cone 25 mm)

Approved injection-pump test benches	Calibrating fuel-injec. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 5..	1 680 750 008	6x2.0x600 mm	M14x1.5/M14x1.5	0 681 343 009	172...175	0 681 443 014	–
EFEP 25..	1 680 750 014		M14x1.5/M12x1.5	1 688 901 016	207...210	1 688 901 999	0.5 mm
EFEP 41..				1 688 901 017			0,6 mm
EFEP 375..							–
EFEP 385..							–
							–
EFEP 390..							–
EFEP 410..							–
EFEP 500..							–
EFEP 515..							–
EFEP 615..							–
							–
EPS 270..							–
EPS 604..							–
EPS 704..							–
EPS 707..							–
EPS 711..	V	V	V	V	V	V	–

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..A.., PE(S)..AM..(Diameter of drive cone 17 mm)

Approved injection pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 022	1 417 413 000 *	1.5 bar	25...27	1.0
EFEP 375..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 022	1 417 413 019	2.0 bar		2.8
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 022	(see test specs.)			
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 410..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 022				
EFEP 500..	Series	1 685 700 143	1 686 401 031	1 686 430 022				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 022				
EPS 270..	Series	1 685 700 143	1 686 401 031	1 686 430 022				
EPS 604..	Series	1 685 700 143	1 686 401 030	1 686 430 022				
EPS 704..	Series	1 685 700 143	1 686 401 030	1 686 430 022				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 022				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 022	V	V	V	V

* Flushing prescribed for all versions of PE(S)..A..D.., as of 8 mm plunger-and-barrel assembly diameter for all other PE(S)..A...

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..A.., PE(S)..AM..(Diameter of drive cone 17 mm)

Approved injection pump test benches	Calibrating fuel-injec. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 014	6x2.0x600 mm	M12x1.5/M14x1.5	0 681 343 009	172...175	0 681 343 014	–
EFEP 375..	V	V	V	V	V	V	V
EFEP 385..							
EFEP 390..							
EFEP 410..							
EFEP 500..							
EFEP 515..							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..							

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..A.., PE(S)..AM..(Diameter of drive cone 20 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 024	1 417 413 000 *	1.5 bar	25...27	1.0
EFEP 375..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 024	1 417 413 019	2.0 bar		2.8
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 024	(see test specs.)			
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 410..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 024				
EFEP 500..	Series	1 685 700 143	1 686 401 031	1 686 430 024				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 024				
EPS 270..	Series	1 685 700 143	1 686 401 031	1 686 430 024				
EPS 604..	Series	1 685 700 143	1 686 401 030	1 686 430 024				
EPS 704..	Series	1 685 700 143	1 686 401 030	1 686 430 024				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 024				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 024	V	V	V	V

* Flushing prescribed for all versions of PE(S)..A..D.., as of 8 mm plunger-and-barrel assembly diameter for all other PE(S)..A...

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..A.., PE(S)..AM..(Diameter of drive cone 20 mm)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 008	6x2.0x600 mm	M14x1.5/M14x1.5	0 681 343 009	172...175	0 681 343 014	–
EFEP 375..	1 680 750 014	6x2.0x600 mm	M12x1.5/M14x1.5	1 688 901 017	207...210	1 688 901 999	0.6
EFEP 385..	1 680 750 015	6x1.5x600 mm	M14x1.5/M14x1.5	1 688 901 025	172...175	1 688 901 991	0.5
EFEP 390..	9 681 230 702	6x2.0x600 mm	9/16"-18/M14x1.5	1 688 901 101	207...210	1 688 901 990	0.6
EFEP 410..	9 681 230 706	6x2.0x600 mm	9/16"-18/M14x1.5 (Ermeto)	V	V	V	V
EFEP 500..	9 681 271 001	6x2.0x600 mm	V				
EFEP 515..	9 681 271 020	6x2.0x600 mm					
EFEP 615..	9 681 271 029	6x2.0x600 mm					
EPS 270..	9 681 271 032	6x2.0x600 mm					
EPS 604..	V	V					
EPS 704..							
EPS 707..							
EPS 711..							

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..A.., (Diameter of drive cone 25 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 026	1 417 413 000	1.5 bar	25...27	1.0
EFEP 375..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 026	1 417 413 019	2.0 bar		2.8
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 026+	(see test specs.)			
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 026+				
EFEP 410..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 026				
EFEP 500..	Series	1 685 700 143	1 686 401 031	1 686 430 026				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 026+				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 026+				
EPS 270..	Series	1 685 700 143	1 686 401 031	1 686 430 026				
EPS 604..	Series	1 685 700 143	1 686 401 030	1 686 430 026				
EPS 704..	Series	1 685 700 143	1 686 401 030	1 686 430 026				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 026+				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 026+	V	V	V	V

+ or 1 686 430 030

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..A.., (Diameter of drive cone 25 mm)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Order no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Order no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 014	6x2.0x600 mm	M12x1.5/M14x1.5	0 681 343 009	172...175	0 681 343 014	–
EFEP 375..	V	V	V	V	V	V	V
EFEP 385..							
EFEP 390..							
EFEP 410..							
EFEP 500..							
EFEP 515..							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..							

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..B.., (Diameter of drive cone 20 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 024	1 417 413 000	1.5 bar	25...27	1.0
EFEP 375..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 024	(see test specs.)			
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 410.. *	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 024				
EFEP 500..	Series	1 685 700 143	1 686 401 031	1 686 430 024				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 024				
EPS 270..	Series	1 685 700 143	1 686 401 031	1 686 430 024				
EPS 604..	Series	1 685 700 143	1 686 401 030	1 686 430 024				
EPS 704..	Series	1 685 700 143	1 686 401 030	1 686 430 024				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 024				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 024	V	V	V	V

* Only up to PE(S) 8 B 110..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..B.., (Diameter of drive cone 20 mm)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 015	6x1.5x600 mm	M14x1.5/M14x1.5	0 681 343 009	172...175	0 681 343 014	–
EFEP 375..	V	V	V	V	V	V	V
EFEP 385..							
EFEP 390..							
EFEP 410..							
EFEP 500..							
EFEP 515..							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..							

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..BV.., (Diameter of drive cone 25 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 024	1 417 413 000	1.5 bar	25...27	1.0
EFEP 375..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 026	(see test specs.)			
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 026+				
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 026+				
EFEP 410.. *	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 026				
EFEP 500..	Series	1 685 700 143	1 686 401 031	1 686 430 026				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 026+				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 026+				
EPS 270..	Series	1 685 700 143	1 686 401 031	1 686 430 026				
EPS 604..	Series	1 685 707 143	1 686 401 030	1 686 430 026				
EPS 704..	Series	1 685 707 143	1 686 401 030	1 686 430 026				
EPS 707...	Series	1 685 707 140	1 686 401 026	1 686 430 026+				
EPS 711..	Series	1 685 707 140	1 686 401 026	1 686 430 026+	V	V	V	V

* Only up to PE(S) 8 BV 120..
\+ or 1 686 430 030

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..BV.., (Diameter of drive cone 25 mm)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 026	6x1.5x600 mm	M14x1.5/M18x1.5	0 681 443 022	172...175	0 681 443 021	–
EFEP 375..	1 680 750 010	6x1.5x600 mm	M14x1.5/M18x1.5				
EFEP 385..							
EFEP 390..							
EFEP 410..							
EFEP 500..							
EFEP 515..							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..	V	V	V	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter up to 11 mm and diameter of drive cone 17 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 022	1 417 413 025	1.5 bar	25...27	1.5
EFEP 375..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 022	(see test specs.)			
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 410.. *	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 022				
EFEP 500.. **	Series	1 685 700 143	1 686 401 031	1 686 430 022				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 022				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 022				
EPS 270.. **	Series	1 685 700 143	1 686 401 031	1 686 430 022				
EPS 604.. **	Series	1 685 700 143	1 686 401 030	1 686 430 022				
EPS 704..	Series	1 685 700 143	1 686 401 030	1 686 430 022				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 022				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 022	V	V	V	V

* up to PE(S) 8 P 110..
** up to PE(S) 6 P 110..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter up to 11 mm and diameter of drive cone 17 mm)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 015	6x1.5x600 mm	M14x1.5/M14x1.5	0 681 343 009	172...175	0 681 443 014	–
EFEP 375..	V	V	V	V	V	V	V
EFEP 385..							
EFEP 390..							
EFEP 410.. *							
EFEP 500.. **							
EFEP 515..							
EFEP 615..							
EPS 270.. **							
EPS 604.. **							
EPS 704..							
EPS 707..							
EPS 711..							

* up to PE(S) 8 P 110..
** up to PE(S) 6 P 110..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter up to 11 mm and diameter of drive cone 20 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 024	1 417 413 025	1.5 bar	25...27	1.5
EFEP 375..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 024	(see test specs.)			
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 410.. *	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 024				
EFEP 500.. **	Series	1 685 700 143	1 686 401 031	1 686 430 024				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 024				
EPS 270.. **	Series	1 685 700 143	1 686 401 031	1 686 430 024				
EPS 604.. **	Series	1 685 700 143	1 686 401 030	1 686 430 024				
EPS 704..	Series	1 685 700 143	1 686 401 030	1 686 430 024				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 024				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 024	V	V	V	V

* up to PE(S) 8 P 110..
** up to PE(S) 6 P 110..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter up to 11 mm and diameter of drive cone 20 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 024	1 417 413 025	1.5 bar	25...27	1.5
EFEP 375..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 024	(see test specs.)			
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 410.. *	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 024				
EFEP 500.. **	Series	1 685 700 143	1 686 401 031	1 686 430 024				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 024				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 024				
EPS 270.. **	Series	1 685 700 143	1 686 401 031	1 686 430 024				
EPS 604.. **	Series	1 685 700 143	1 686 401 030	1 686 430 024				
EPS 704..	Series	1 685 700 143	1 686 401 030	1 686 430 024				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 024				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 024	V	V	V	V

* up to PE(S) 8 P 110..
** up to PE(S) 6 P 110..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter up to 11 mm and diameter of drive cone 25 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 024	1 417 413 025	1.5 bar	25...27	1.5
EFEP 375..	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 026	(see test specs.)			
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 030				
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 030				
EFEP 410.. *	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 026				
EFEP 500.. **	Series	1 685 700 143	1 686 401 031	1 686 430 026				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 030				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 030				
EPS 270.. **	Series	1 685 700 143	1 686 401 031	1 686 430 026				
EPS 604.. **	Series	1 685 700 143	1 686 401 030	1 686 430 026				
EPS 704..	Series	1 686 700 143	1 686 401 030	1 686 430 026				
EPS 707..	Series	1 686 700 140	1 686 401 026	1 686 430 030				
EPS 711..	Series	1 686 700 140	1 686 401 026	1 686 430 030	V	V	V	V

* up to PE(S) 8 P 110..
** up to PE(S) 6 P 110..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter up to 11 mm and diameter of drive cone 25 mm)

Approved injection-pump test benches	Calibrating fuel-injec. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 015	6x1.5x600 mm	M14x1.5/M14x1.5	0 681 343 009	172...175	0 681 443 014	–
EFEP 375..	1 680 750 077	8x4.0x1000 mm	M18x1.5/M18x1.5	1 688 901 016	207...211	1 688 901 999	0.5
EFEP 385..	9 681 230 724	6x1.5x750 mm	M14x1.5/M14x1.5	0 681 443 022	172...175	0 681 443 021	–
EFEP 390..							
EFEP 410.. *							
EFEP 500.. **							
EFEP 515..							
EFEP 615..							
EPS 270.. **							
EPS 604.. **							
EPS 704..							
EPS 707..							
EPS 711..	V	V	V	V	V	V	V

* up to PE(S) 8 P 110..
** up to PE(S) 6 P 110..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter as of 12 mm and diameter of drive cone 25 mm, not PE(S)..P..S7000, 7100, 7800)

Approved injection pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41	Series	1 685 700 140	1 686 401 028	1 686 430 030	1 417 413 025	1.5 bar	25...27	1.5
EFEP 375.. 1)	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 026	1 417 413 040	1.2 bar		
EFEP 385.. 2)	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 030	1 417 413 038	2.0 bar		
EFEP 390.. 3)	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 030	2 417 413 011	1.2 bar		
EFEP 410.. 1)	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 026	(see test specs.)			
EFEP 500.. 1)	Series	1 685 700 143	1 686 401 031	1 686 430 026				
EFEP 515.. 4)	Series	1 685 700 140	1 686 401 028	1 686 430 030				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 030				
EPS 270.. 1)	Series	1 685 700 143	1 686 401 031	1 686 430 026				
EPS 604.. 1)	Series	1 685 700 143	1 686 401 030	1 686 430 026				
EPS 704.. 1)	Series	1 685 700 143	1 686 401 030	1 686 430 026				
EPS 707.. 4)	Series	1 685 700 140	1 686 401 026	1 686 430 030				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 030	V	V	V	V

1) up to PE(S) 6 P 120..
2) up to PE(S) 8 P 120..
3) up to PE(S) 12 P 120..
4) up to PE(S) 8 P 130..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter as of 12 mm and diameter of drive cone 25 mm, not PE(S)..P..S7000, 7100, 7800)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 015	6x1.5x600 mm	M14x1.5/M14x1.5	0 681 443 022	172...175	0 681 443 021	–
EFEP 375.. 1)	1 680 750 026	6x1.5x600 mm	M14x1.5/M18x1.5	1 681 443 019	207...211	1 688 901 999	0.8
EFEP 385.. 2)	1 680 750 060	8x2.0x1000 mm	M14x1.5/M18x1.5	1 688 901 017	207...211		0.6
EFEP 390.. 3)	1 680 750 061	8x2.0x1000 mm	M16x1.5/M18x1.5				
EFEP 410.. 1)	1 680 750 067	6x1.5x1000 mm	M14x1.5/M14x1.5				
EFEP 500.. 1)	1 680 750 074	6x1.5x1000 mm	M16x1.5/M14x1.5				
EFEP 515.. 4)	1 680 750 075*	8x2.5x1000 mm	M14x1.5/M14x1.5				
EFEP 615..	9 681 230 724	6x1.5x750 mm	M14x1.5/M14x1.5				
EPS 270.. 1)							
EPS 604.. 1)							
EPS 704.. 1)							
EPS 707.. 4)							
EPS 711..	V	V	V	V	V	V	V

1) up to PE(S) 6 P 120..
2) up to PE(S) 8 P 120..
3) up to PE(S) 12 P 120..
4) up to PE(S) 8 P 130..

* Replacement for 1 680 750 067. Only as a set, mixed operation with 1 680 750 067 not permitted.

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter as of 12 mm and diameter of drive cone 30 mm, not PE(S)..P..S7000, 7100, 7800)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 034	1 417 413 025	1.5 bar	25...27	1.5
EFEP 375.. 1)	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 034	1 417 413 040	1.2 bar		
EFEP 385.. 2)	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 034	1 417 413 038	2.0 bar		
EFEP 390.. 3)	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 034	2 417 413 011	1.2 bar		
EFEP 410.. 1)	1 686 609 057	1 685 700 143	1 686 401 031	1 686 430 034	(see test specs.)			
EFEP 500.. 1)	Series	1 685 700 143	1 686 401 031	1 686 430 034				
EFEP 515.. 4)	Series	1 685 700 140	1 686 401 028	1 686 430 034				
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 034				
EPS 270.. 1)	Series	1 685 700 143	1 686 401 031	1 686 430 034				
EPS 604.. 1)	Series	1 685 700 143	1 686 401 030	1 686 430 034				
EPS 704.. 1)	Series	1 685 700 143	1 686 401 030	1 686 430 034				
EPS 707.. 4)	Series	1 685 700 140	1 686 401 026	1 686 430 034				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 034	V	V	V	V

1) up to PE(S) 6 P 120..
2) up to PE(S) 8 P 120..
3) up to PE(S) 12 P 120..
4) up to PE(S) 8 P 130..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter as of 12 mm and diameter of drive cone 30 mm, not PE(S)..P..S7000, 7100, 7800)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 015	6x1.5x600 mm	M14x1.5/M14x1.5	0 681 443 022	172...175	0 681 443 021	–
EFEP 375.. 1)	1 680 750 026	6x1.5x600 mm	M14x1.5/M18x1.5	1 688 901 019	207...211	1 688 901 999	0.8
EFEP 385.. 2)	1 680 750 060	8x2.0x1000 mm	M14x1.5/M18x1.5	1 688 901 017	207...211		0.6
EFEP 390.. 3)	1 680 750 061	8x2.0x1000 mm	M16x1.5/M18x1.5				
EFEP 410.. 1)	1 680 750 067	6x1.5x1000 mm	M14x1.5/M14x1.5				
EFEP 500.. 1)	1 680 750 074	6x1.5x1000 mm	M16x1.5/M14x1.5				
EFEP 515.. 4)	1 680 750 075*	8x2.5x1000 mm	M14x1.5/M14x1.5				
EFEP 615..	9 681 230 724	6x1.5x750 mm	M14x1.5/M14x1.5				
EPS 270.. 1)							
EPS 604.. 1)							
EPS 704.. 1)							
EPS 707.. 4)							
EPS 711..	V	V	V	V	V	V	V

1) up to PE(S) 6 P 120..
2) up to PE(S) 8 P 120..
3) up to PE(S) 12 P 120..
4) up to PE(S) 8 P 130..

* Replacement for 1 680 750 067. Only as a set, mixed operation with 1 680 750 067 not permitted.

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter as of 12 mm and diameter of drive cone 25 mm, only PE(S)..P..S7000, 7100, 7800)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 030	1 417 413 025	1.5 bar	25...27	1.5
EFEP 385.. 1)	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 030	1 417 413 040	1.2 bar	25...27	|
EFEP 390.. 2)	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 030	2 417 413 011	1.2 bar	|	|
EFEP 515.. 3)	Series	1 685 700 140	1 686 401 028	1 686 430 030	2 417 413 038	2.0 bar	|	|
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 030	(see test specs.)	|	|	|
EPS 707.. 3)	Series	1 685 700 140	1 686 401 026	1 686 430 030	|	|	|	|
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 030	V	V	V	V

1) up to PE(S) 8 P 120..Not permissible when using calibrating nozzle-holder assembly 1 688 901 017.
2) up to PE(S) 12 P 120..Not permissible when using calibrating nozzle-holder assembly 1 688 901 017.
3) up to PE(S) 8 P 130..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter as of 12 mm and diameter of drive cone 25 mm, only PE(S)..P..S7000, 7100, 7800)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 015	6x1.5x600 mm	M14x1.5/M14x1.5	1 688 901 017	207...211	1 688 901 999	0.6
EFEP 385.. 1)	1 680 750 067	6x1.5x1000 mm	M14x1.5/M14x1.5	1 688 901 019	207...211		0.8
EFEP 390.. 2)	1 680 750 074	6x1.5x1000 mm	M16x1.5/M14x1.5				
EFEP 515.. 3)	1 680 750 075*	8x2.5x1000 mm	M14x1.5/M14x1.5				
EFEP 615..	9 681 230 724	6x1.5x750 mm	M14x1.5/M14x1.5				
EPS 707.. 3)	V	V	V	V	V	V	V
EPS 711..							

1) up to PE(S) 8 P 120..Not permissible when using calibrating nozzle-holder assembly 1 688 901 017.
2) up to PE(S) 12 P 120..Not permissible when using calibrating nozzle-holder assembly 1 688 901 017.
3) up to PE(S) 8 P 130..

* Replacement for 1 680 750 067. Only as a set, mixed operation with 1 680 750 067 not permitted.

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter as of 12 mm and diameter of drive cone 30 mm, only PE(S)..P..S7000, 7100, 7800)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 034	1 417 413 025	1.5 bar	25...27	1.5
EFEP 385.. 1)	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 034	1 417 413 040	1.2 bar		
EFEP 390.. 2)	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 034	2 417 413 011	1.2 bar		
EFEP 515.. 3)	Series	1 685 700 140	1 686 401 028	1 686 430 034	2 417 413 038	2.0 bar		
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 034	(see test specs.)			
EPS 707.. 3)	Series	1 685 700 140	1 686 401 026	1 686 430 034				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 034	V	V	V	V

1) up to PE(S) 8 P 120..Not permissible when using calibrating nozzle-holder assembly 1 688 901 017.
2) up to PE(S) 12 P 120..Not permissible when using calibrating nozzle-holder assembly 1 688 901 017.
3) up to PE(S) 8 P 130..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter as of 12 mm and diameter of drive cone 30 mm, only PE(S)..P..S7000, 7100, 7800)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 015	6x1.5x600 mm	M14x1.5/M14x1.5	1 688 901 017	207...211	1 688 901 999	0.6
EFEP 385.. 1)	1 680 750 067	6x1.5x1000 mm	M14x1.5/M14x1.5	1 688 901 019	207...211		0.8
EFEP 390.. 2)	1 680 750 074	6x1.5x1000 mm	M16x1.5/M14x1.5				
EFEP 515.. 3)	1 680 750 075*	8x2.5x1000 mm	M14x1.5/M14x1.5				
EFEP 615..	9 681 230 724	6x1.5x750 mm	M14x1.5/M14x1.5				
EPS 707.. 3)	V	V	V	V	V	V	V
EPS 711..							

1) up to PE(S) 8 P 120..Not permissible when using calibrating nozzle-holder assembly 1 688 901 017.
2) up to PE(S) 12 P 120..Not permissible when using calibrating nozzle-holder assembly 1 688 901 017.
3) up to PE(S) 8 P 130..

* Replacement for 1 680 750 067. Only as a set, mixed operation with 1 680 750 067 not permitted.

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter as of 12 mm and diameter of drive cone 35 mm, only PE(S)..P..S7000, 7100, 7800)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 017	1 417 413 025	1.5 bar	25...27	1.5
EFEP 385.. 1)	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 017	1 417 413 040	1.2 bar		
EFEP 390.. 2)	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 017	2 417 413 011	1.2 bar		
EFEP 515.. 3)	Series	1 685 700 140	1 686 401 028	1 686 430 017	2 417 413 038	2.0 bar		
EFEP 615..	Series	1 685 700 140	1 686 401 028	1 686 430 017	(see test specs.)			
EPS 707.. 3)	Series	1 685 700 140	1 686 401 026	1 686 430 017				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 017	V	V	V	V

1) up to PE(S) 8 P 120..Not permissible when using calibrating nozzle-holder assembly 1 688 901 017.
2) up to PE(S) 12 P 120..Not permissible when using calibrating nozzle-holder assembly 1 688 901 017.
3) up to PE(S) 8 P 130..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE(S)..P..(Plunger diameter as of 12 mm and diameter of drive cone 35 mm, only PE(S)..P..S7000, 7100, 7800)

Approved in-jection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 015	6x1.5x600 mm	M14x1.5/M14x1.5	1 688 901 017	207...211	1 688 901 999	0.6
EFEP 385.. 1)	1 680 750 067	6x1.5x1000 mm	M14x1.5/M14x1.5	1 688 901 019	207...211		0.8
EFEP 390.. 2)	1 680 750 074	6x1.5x1000 mm	M16x1.5/M14x1.5				
EFEP 515.. 3)	1 680 750 075*	8x2.5x1000 mm	M14x1.5/M14x1.5				
EPS 615..	9 681 230 724	6x1.5x750 mm	M14x1.5/M14x1.5				
EPS 707.. 3)	V	V	V	V	V	V	V
EPS 711..							

1) up to PE(S) 8 P 120..Not permissible when using calibrating nozzle-holder assembly 1 688 901 017.
2) up to PE(S) 12 P 120..Not permissible when using calibrating nozzle-holder assembly 1 688 901 017.
3) up to PE(S) 8 P 130..

* Replacement for 1 680 750 067. Only as a set, mixed operation with 1 680 750 067 not permitted.

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE..ZW(M)..(up to and including ..S 2999)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 034	1 417 413 025 (see test specs.)	1.5 bar	25...27	1.5
EFEP 385.. 1)	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 034	V	V	V	V
EFEP 390.. 1)	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 034				
EFEP 515.. 2)	Series	1 685 700 140	1 686 401 028	1 686 430 034				
EPS 615..	Series	1 685 700 140	1 686 401 028	1 686 430 034				
EPS 707.. 2)	Series	1 685 700 140	1 686 401 026	1 686 430 034				
EPS 711.. *	Series	1 685 700 140	1 686 401 026	1 686 430 034				

1) up to PE 8 ZW(M) 140..
2) up to PE 8 ZW(M)..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE..ZW(M)..(up to and including ..S 2999)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 016	8x2.0x1500 mm	M20x1.5/M18x1.5	0 681 443 022	172...175	0 681 443 021	–
EFEP 385.. 1)	1 680 750 027	8x2.0x1500 mm	M18x1.5/M18x1.5				
EFEP 390.. 1)							
EFEP 515.. 2)							
EPS 615..							
EPS 707.. 2)							
EPS 711..	V	V	V	V	V	V	V

1) up to PE 8 ZW(M) 140..
2) up to PE 8 ZW(M)..

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE..Y.., PE..Z.., PE..ZV..,(Diameter of drive cone 30 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	1 685 700 140	1 686 401 028	1 686 430 034	1 417 413 025	1.5 bar	25...27	1.5
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 034	(see test specs.)			
EFEP 390..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 034				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 034				
EPS 615..	Series	1 685 700 140	1 686 401 028	1 686 430 034				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 034				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 034	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE..Y.., PE..Z.., PE..ZV..,(Diameter of drive cone 30 mm)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 027	8x2.0x1500 mm	M18x1.5/M18x1.5	0 681 443 022	172...175	0 681 443 021	–
EFEP 385..	V	V	V	V	V	V	V
EFEP 390..							
EFEP 515..							
EPS 615..							
EPS 707..							
EPS 711..							

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE..Y.., PE..Z.., PE..ZV..,(Diameter of drive cone 35 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 019	1 417 413 025	1.5 bar	25...27	1.5
EFEP 385..	1 686 609 057	1 685 700 140	1 686 401 028	1 686 430 019	(see test specs.)			
EFEP 390..	Series	1 685 700 140	1 686 401 028	1 686 430 019				
EFEP 515..	Series	1 685 700 140	1 686 401 028	1 686 430 019				
EPS 615..	Series	1 685 700 140	1 686 401 028	1 686 430 019				
EPS 707..	Series	1 685 700 140	1 686 401 026	1 686 430 019				
EPS 711..	Series	1 685 700 140	1 686 401 026	1 686 430 019	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PE..Y.., PE..Z.., PE..ZV..,(Diameter of drive cone 35 mm)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 027	8x2.0x1500 mm	M18x1.5/M18x1.5	0 681 443 022	172...175	0 681 443 021	–
EFEP 385..	V	V	V	V	V	V	V
EFEP 390..							
EFEP 515..							
EPS 615..							
EPS 707..							
EPS 711..							

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PF(R)..K..

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 5..	Series	–	1 686 401 028	–	(see test specs.)		30...32	1.0
EFEP 25..	Series		1 686 401 031					1.5
EFEP 41..	Series		1 686 401 031					
EFEP 375..	Series *		1 686 401 031					
EFEP 385..	Series *		1 686 401 028					
EFEP 390..	Series *		1 686 401 028					
EFEP 410..	Series *		1 686 401 031					
EFEP 500..	Series		1 686 401 031					
EFEP 515..	Series		1 686 401 028					
EFEP 615..	Series		1 686 401 028					
EPS 270..	Series		1 686 401 031					
EPS 604..	Series		1 686 401 030					
EPS 704..	Series		1 686 401 030					
EPS 707..	Series		1 686 401 026					
EPS 711..	Series	V	1 686 401 026	V	V	V	V	V

* = When using calibrating nozzle-holder assemblies with perforated plate only perm. with large inertia flywheel 1 686 609 057!

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PF(R)..K..

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 5..	1 680 750 014	6x2.0x600 mm	M14x1.5/M12x1.5	0 681 343 009	172...175	0 681 443 014	–
EFEP 25..	1 680 750 081	6x2.1x600 mm	M14x1.5/M12x1.5	1 688 901 025	172...175	1 688 901 991	0.5
EFEP 41..	1 680 750 082	6x2.25x267 mm	M14x1.5/M12x1.5	1 688 901 031+	172...175	1 688 901 991	0.5
EFEP 375.. *							
EFEP 385.. *							
EFEP 390.. *							
EFEP 410.. *							
EFEP 500..							
EFEP 515..							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..	V	V	V	V	V	V	V

* = When using calibrating nozzle-holder assemblies with perforated plate only perm. with large inertia flywheel 1 686 609 057!

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PF(R)..A..

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	–	1 686 401 028	–	(see test specs.)		30...32	1.0
EFEP 375..	1 686 609 057		1 686 401 031					
EFEP 385..	1 686 609 057		1 686 401 028					
EFEP 390..	1 686 609 057		1 686 401 028					
EFEP 410..	1 686 609 057		1 686 401 031					
EFEP 500..	Series		1 686 401 031					
EFEP 515..	Series		1 686 401 028					
EFEP 615..	Series		1 686 401 028					
EPS 270..	Series		1 686 401 031					
EPS 604..	Series		1 686 401 030					
EPS 704..	Series		1 686 401 030					
EPS 707..	Series		1 686 401 026					
EPS 711..	Series	V	1 686 401 026	V	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PF(R)..A..

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 014	6x2.0x600 mm	M14x1.5/M12x1.5	0 681 343 009	172...175	0 681 443 014	–
EFEP 375..	V	V	V	V	V	V	V
EFEP 385..							
EFEP 390..							
EFEP 410..							
EFEP 500..							
EFEP 515..							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..							

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PF(R)..B..

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	–	1 686 401 028	–	(see test specs.)		30...32	1.0
EFEP 375..	1 686 609 057		1 686 401 031					
EFEP 385..	1 686 609 057		1 686 401 028					
EFEP 390..	1 686 609 057		1 686 401 028					
EFEP 410..	1 686 609 057		1 686 401 031					
EFEP 500..	Series		1 686 401 031					
EFEP 515..	Series		1 686 401 028					
EFEP 615..	Series		1 686 401 028					
EPS 270..	Series		1 686 401 031					
EPS 604..	Series		1 686 401 030					
EPS 704..	Series		1 686 401 030					
EPS 707..	Series		1 686 401 026					
EPS 711..	Series	V	1 686 401 026	V	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PF(R)..B..

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 015	6x1.5x600 mm	M14x1.5/M14x1.5	0 681 343 009	172...175	0 681 443 014	–
EFEP 375..	V	V	V	V	V	V	V
EFEP 385..							
EFEP 390..							
EFEP 410..							
EFEP 500..							
EFEP 515..							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..							

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PF(R)1W.., PF(R)1Z..

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 41..	Series	–	1 686 401 028	–	(see test specs.)		30...32	1.0
EFEP 375..	1 686 609 057		1 686 401 031					
EFEP 385..	1 686 609 057		1 686 401 028					
EFEP 390..	1 686 609 057		1 686 401 028					
EFEP 410..	1 686 609 057		1 686 401 031					
EFEP 500..	Series		1 686 401 031					
EFEP 515..	Series		1 686 401 028					
EFEP 615..	Series		1 686 401 028					
EPS 270..	Series		1 686 401 031					
EPS 604..	Series		1 686 401 030					
EPS 704..	Series		1 686 401 030					
EPS 707..	Series		1 686 401 026					
EPS 711..	Series	V	1 686 401 026	V	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: PF(R)1W.., PF(R)1Z..

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 41..	1 680 750 011	8x2.0x1500 mm	M22x1.5/M18x1.5	0 681 443 022	172...175	0 681 443 021	–
EFEP 375..	V	V	V	V	V	V	V
EFEP 385..							
EFEP 390..							
EFEP 410..							
EFEP 500..							
EFEP 515..							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..							

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: VM..

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 5 C	Series	–	1 686 401 031	1 686 430 022	Original (see test specs.)			0.04
EFEP 25 E	Series		1 686 401 031	1 686 430 022				
EFEP 25 F	Series		1 686 401 031	1 686 430 022				
EFEP 41..	Series		1 686 401 028	1 686 430 022				
EFEP 375..	1 686 609 057		1 686 401 031	1 686 430 022				
EFEP 385..	1 686 609 057		1 686 401 028	1 686 430 022				
EFEP 390..	1 686 609 057		1 686 401 028	1 686 430 022				
EFEP 410..	1 686 609 057		1 686 401 031	1 686 430 022				
EFEP 500..	Series		1 686 401 031	1 686 430 022				
EFEP 515..	Series		1 686 401 028	1 686 430 022				
EFEP 615..	Series		1 686 401 028	1 686 430 022				
EPS 270..	Series		1 686 401 031	1 686 430 022				
EPS 604..	Series		1 686 401 030	1 686 430 022				
EPS 704..	Series		1 686 401 030	1 686 430 022				
EPS 707..	Series		1 686 401 026	1 686 430 022				
EPS 711..	Series	V	1 686 401 026	1 686 430 022	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model: VM..

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 5 C	1 680 750 017	6x2.0x840 mm	M12x1.5/M14x1.5	1 688 901 000	147...150	0 681 443 014	–
EFEP 25 E	1 680 750 028	6x2.0x840 mm	M14x1.5/M14x1.5				
EFEP 25 F							
EFEP 41..							
EFEP 375..							
EFEP 385..							
EFEP 390..							
EFEP 410..							
EFEP 500..							
EFEP 515..							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..	V	V	V	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model:(EP/)VA..(Diameter of drive cone 17 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 5 C	Series	–	1 686 401 031	1 686 430 022	–	–	–	0,2
EFEP 25 E	Series		1 686 401 031	1 686 430 022				
EFEP 25 F	Series		1 686 401 031	1 686 430 022				
EFEP 41..	Series		1 686 401 028	1 686 430 022				
EFEP 375..	1 686 609 057		1 686 401 031	1 686 430 022				
EFEP 385..	1 686 609 057		1 686 401 028	1 686 430 022				
EFEP 390..	1 686 609 057		1 686 401 028	1 686 430 022				
EFEP 410..	1 686 609 057		1 686 401 031	1 686 430 022				
EFEP 500..	Series		1 686 401 031	1 686 430 022				
EFEP 515..	Series		1 686 401 028	1 686 430 022				
EFEP 615..	Series		1 686 401 028	1 686 430 022				
EPS 270..	Series		1 686 401 031	1 686 430 022				
EPS 604..	Series		1 686 401 030	1 686 430 022				
EPS 704..	Series		1 686 401 030	1 686 430 022				
EPS 707..	Series		1 686 401 026	1 686 430 022				
EPS 711..	Series	V	1 686 401 026	1 686 430 022	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model:(EP/)VA..(Diameter of drive cone 17 mm)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 5 C	1 680 750 017	6x2.0x840 mm	M12x1.5/M14x1.5	1 688 901 000	147...150	0 681 443 014	–
EFEP 25 E	1 680 750 028	6x2.0x840 mm	M14x1.5/M14x1.5	1 688 901 020	172...175	1 688 901 999	0.6
EFEP 25 F	1 680 750 031	6x2.0x840 mm	9/16"-18/M14x1.5				
EFEP 41..							
EFEP 375..							
EFEP 385..							
EFEP 390..							
EFEP 410..							
EFEP 500..							
EFEP 515..							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..	V	V	V	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model:(EP/)VA..(Diameter of drive cone 20 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 5 C	Series	–	1 686 401 031	1 686 430 024	–	–	–	0,2
EFEP 25 E	Series		1 686 401 031	1 686 430 024				
EFEP 25 F	Series		1 686 401 031	1 686 430 024				
EFEP 41..	Series		1 686 401 028	1 686 430 024				
EFEP 375..	1 686 609 057		1 686 401 031	1 686 430 024				
EFEP 385..	1 686 609 057		1 686 401 028	1 686 430 024				
EFEP 390..	1 686 609 057		1 686 401 028	1 686 430 024				
EFEP 410..	1 686 609 057		1 686 401 031	1 686 430 024				
EFEP 500..	Series		1 686 401 031	1 686 430 024				
EFEP 515..	Series		1 686 401 028	1 686 430 024				
EFEP 615..	Series		1 686 401 028	1 686 430 024				
EPS 270..	Series		1 686 401 031	1 686 430 024				
EPS 604..	Series		1 686 401 030	1 686 430 024				
EPS 704..	Series		1 686 401 030	1 686 430 024				
EPS 707..	Series		1 686 401 026	1 686 430 024				
EPS 711..	Series	V	1 686 401 026	1 686 430 024	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model:(EP/)VA..(Diameter of drive cone 20 mm)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 5 C	1 680 750 017	6x2.0x840 mm	M12x1.5/M14x1.5	1 688 901 000	147...150	0 681 443 014	-
EFEP 25 E	1 680 750 028	6x2.0x840 mm	M14x1.5/M14x1.5	1 688 901 020	172...175	1 688 901 999	0.6
EFEP 25 F	1 680 750 031	6x2.0x840 mm	9/16"-18/M14x1.5				
EFEP 41..							
EFEP 375..							
EFEP 385..							
EFEP 390..							
EFEP 410..							
EFEP 500..							
EFEP 515..							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..	V	V	V	V	V	V	V

Test benches and test equipment assigned to fuel-injection-pump models

Pump model:VE..(Diameter of drive cone 17 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 5 C *	Series	–	1 686 401 031	1 686 430 022	–	–	–	0.2
EFEP 25 E *	Series		1 686 401 031	1 686 430 022				
EFEP 25 F *	Series		1 686 401 031	1 686 430 022				
EFEP 41..	Series		1 686 401 028	1 686 430 022				
EFEP 375..	1 686 609 057		1 686 401 031	1 686 430 022				
EFEP 385..	1 686 609 057		1 686 401 028	1 686 430 022				
EFEP 390..	1 686 609 057		1 686 401 028	1 686 430 022				
EFEP 410..	1 686 609 057		1 686 401 031	1 686 430 022				
EFEP 500..	Series		1 686 401 031	1 686 430 022				
EFEP 515..	Series		1 686 401 028	1 686 430 022				
EFEP 615..	Series		1 686 401 028	1 686 430 022				
EPS 270..	Series		1 686 401 031	1 686 430 022				
EPS 604..	Series		1 686 401 030	1 686 430 022				
EPS 704..	Series		1 686 401 030	1 686 430 022				
EPS 707..	Series		1 686 401 026	1 686 430 022				
EPS 711..	Series	V	1 686 401 026	1 686 430 022	V	V	V	V

* Utilization permitted only for distributor-type fuel-injection pumps of pre-chamber engines.
(In contrast to direct-injection engines, pre-chamber engines are equipped with a glow-plug system).

Test benches and test equipment assigned to fuel-injection-pump models

Pump model:VE..(Diameter of drive cone 17 mm)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 5 C *	1 680 750 017	6x2.0x840 mm	M12x1.5/M14x1.5	1 688 901 000	147...150	0 681 443 014	–
EFEP 25 E *	1 680 750 073	6x2.0x450 mm	M12x1.5/M14x1.5	1 688 901 020	172...175	1 688 901 999	0.6
EFEP 25 F *				1 688 901 022	130...133	1 688 901 992	–
EFEP 41..				1 688 901 023	172...175	1 688 901 991	0.4
EFEP 375..				1 688 901 027	250...253	1 688 901 991	0.5
EFEP 385..							
EFEP 390..							
EFEP 410..							
EFEP 500..							
EFEP 515..							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..	V	V	V	V	V	V	V

* Utilization permitted only for distributor-type fuel-injection pumps of pre-chamber engines.
(In contrast to direct-injection engines, pre-chamber engines are equipped with a glow-plug system).

Test benches and test equipment assigned to fuel-injection-pump models

Pump model:VE..(Diameter of drive cone 20 mm)

Approved injection-pump test benches	Inertia flywheel	Intermediate flange	Driving coupling	Coupling half	Overflow valve	Nominal pressure	Supply pressure (bar) Prestroke	Supply pressure (bar) Delivery
EFEP 5 C *	Series	–	1 686 401 031	1 686 430 024	–	–	–	0,2
EFEP 25 E *	Series		1 686 401 031	1 686 430 024				
EFEP 25 F *	Series		1 686 401 031	1 686 430 024				
EFEP 41..	Series		1 686 401 028	1 686 430 024				
EFEP 375..	1 686 609 057		1 686 401 031	1 686 430 024				
EFEP 385..	1 686 609 057		1 686 401 028	1 686 430 024				
EFEP 390..	1 686 609 057		1 686 401 028	1 686 430 024				
EFEP 410..	1 686 609 057		1 686 401 031	1 686 430 024				
EFEP 500..	Series		1 686 401 031	1 686 430 024				
EFEP 515..	Series		1 686 401 028	1 686 430 024				
EFEP 615..	Series		1 686 401 028	1 686 430 024				
EPS 270..	Series		1 686 401 031	1 686 430 024				
EPS 604..	Series		1 686 401 030	1 686 430 024				
EPS 704..	Series		1 686 401 030	1 686 430 024				
EPS 707..	Series		1 686 401 026	1 686 430 024				
EPS 711..	Series	V	1 686 401 026	1 686 430 024	V	V	V	V

* Utilization permitted only for distributor-type fuel-injection pumps of pre-chamber engines.
(In contrast to direct-injection engines, pre-chamber engines are equipped with a glow-plug system).

Test benches and test equipment assigned to fuel-injection-pump models

Pump model:VE..(Diameter of drive cone 20 mm)

Approved injection-pump test benches	Calibrating fuel-inj. tubing Part no.	Dimensions	Connecting thread	Calibrating nozzle-holder assy. Part no.	Opening press. (bar)	Calibrating nozzle	Perforated plate
EFEP 5 C	1 680 750 017	6x2.0x840 mm	M12x1.5/M14x1.5	1 688 901 000	147...150	0 681 443 014	–
EFEP 25 E	1 680 750 073	6x2.0x450 mm	M12x1.5/M14x1.5	1 688 901 020	172...175	1 688 901 999	0.6
EFEP 25 F				1 688 901 022	130...133	1 688 901 992	–
EFEP 41..				1 688 901 023	172...175	1 688 901 991	0.4
EFEP 375..				1 688 901 027	250...253	1 688 901 991	0.5
EFEP 385..							
EFEP 390..							
EFEP 410..							
EFEP 500..							
EFEP 515...							
EFEP 615..							
EPS 270..							
EPS 604..							
EPS 704..							
EPS 707..							
EPS 711..	V	V	V	V	V	V	V

* Utilization permitted only for distributor-type fuel-injection pumps of pre-chamber engines.
(In contrast to direct-injection engines, pre-chamber engines are equipped with a glow-plug system).

2. TIGHTENING TORQUES FOR BOSCH IN-LINE PUMPS AND DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS

2.1 Tightening torques for PE(S)..A.., B.., Z.. and PF..fuel-injection pumps

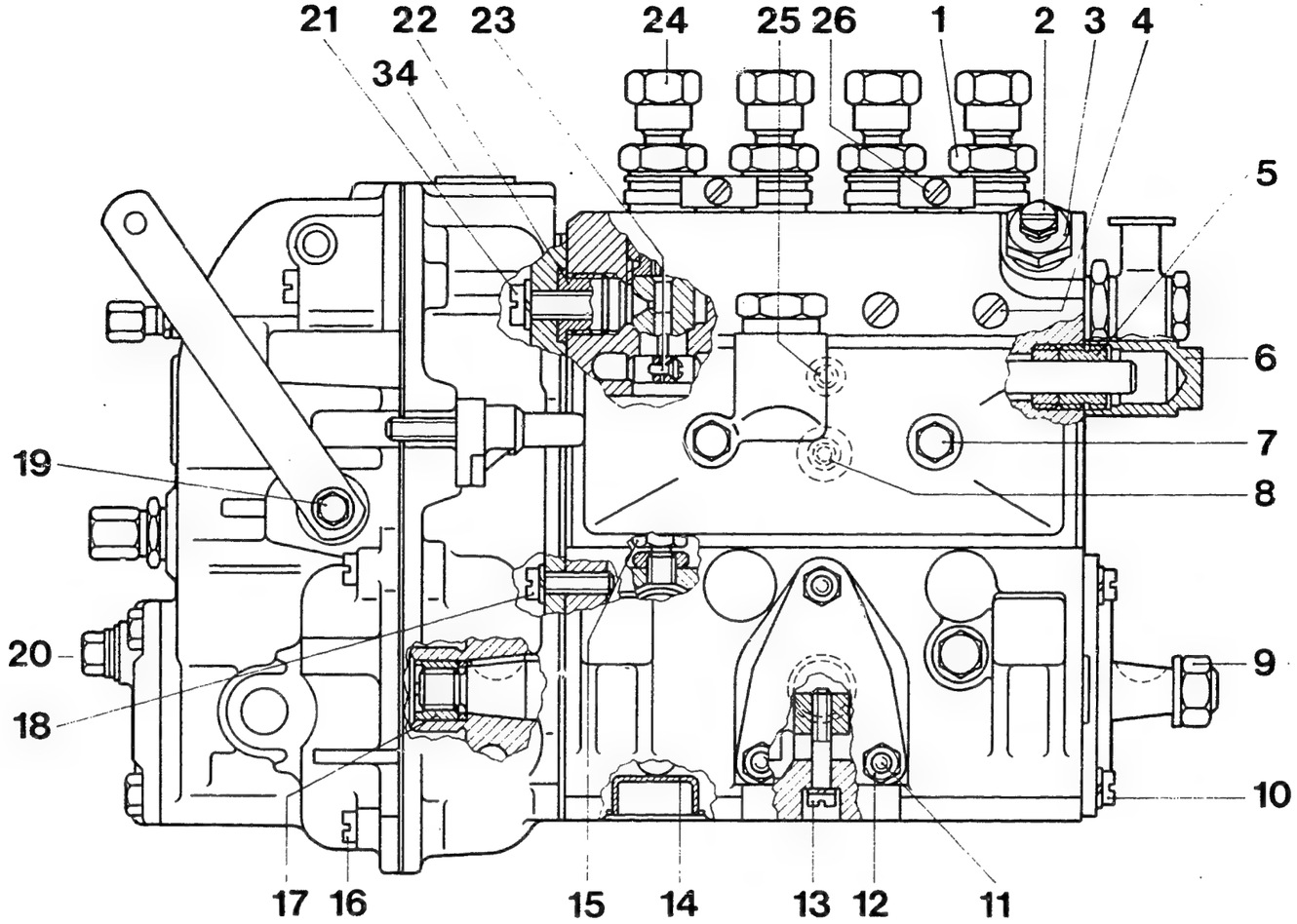
General

The applicable tightening torques for fuel-injection pumps are listed on the following Coordinates. These correspond to the current status and replace the data given in the respective repair instructions.

The corresponding bolts and nuts are marked on the F03...F12 drawing on the following Coordinates .

These items are repeated at the bottom of the list together with an indication of the Coordinates for locating the tightening torque.

For production reasons: continued on the following coordinate.



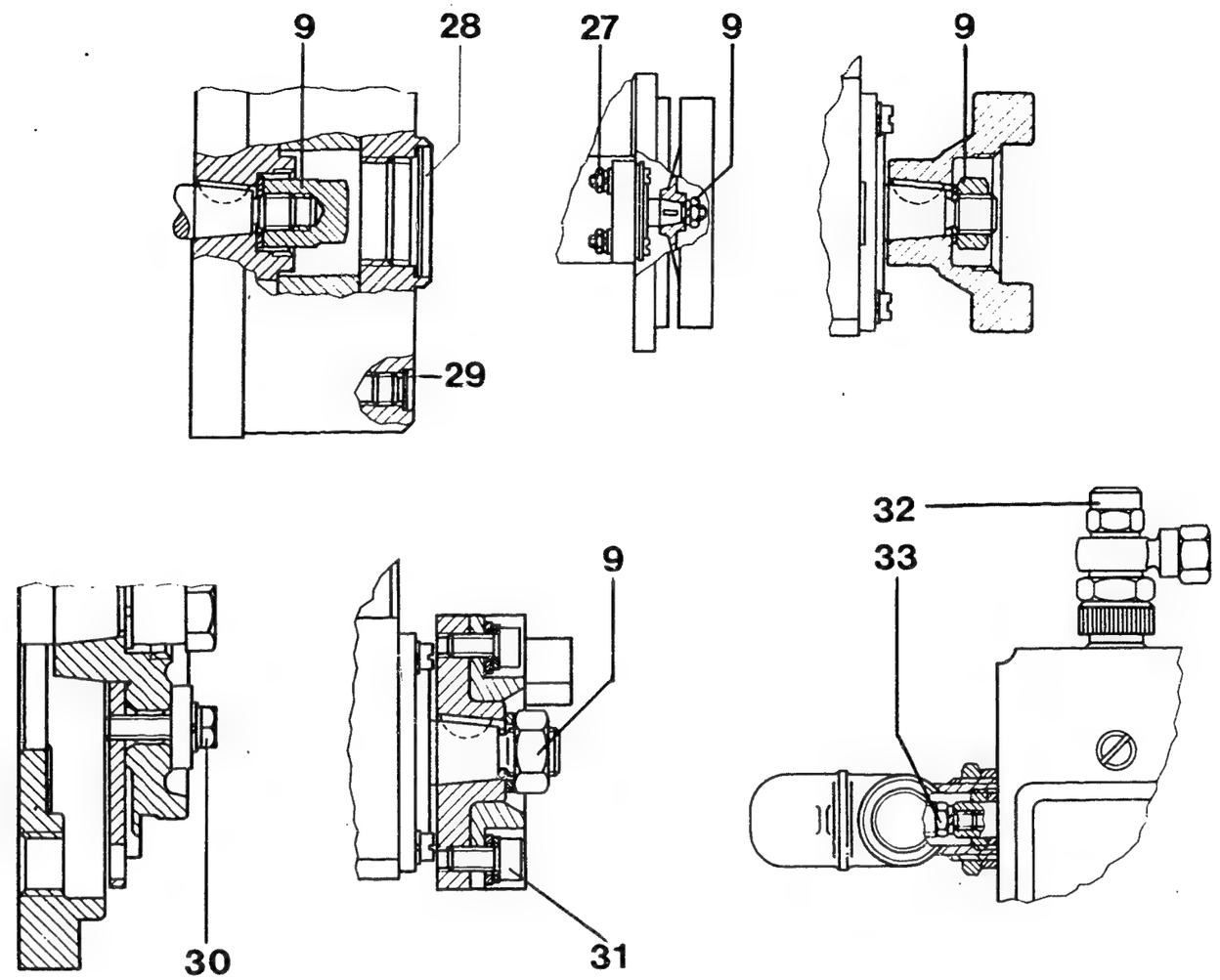
400/081

TIGHTENING TORQUES FOR BOSCH IN-LINE PUMPS AND DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

Item	Coordinates
1	F13/F14
2	F15
3	F15
4	F15
5	F16
6	F16
7	F16
8	F16
9	F16/F17

Item	Coordinates
10	F17
11	F17
12	F18
13	F18
14	F18
15	F18
16	F19
17	F19
18	F19

Item	Coordinates
19	F19
20	F20
21	F20
22	F20
23	F20
24	F21
25	F21
26	F21
34	F22

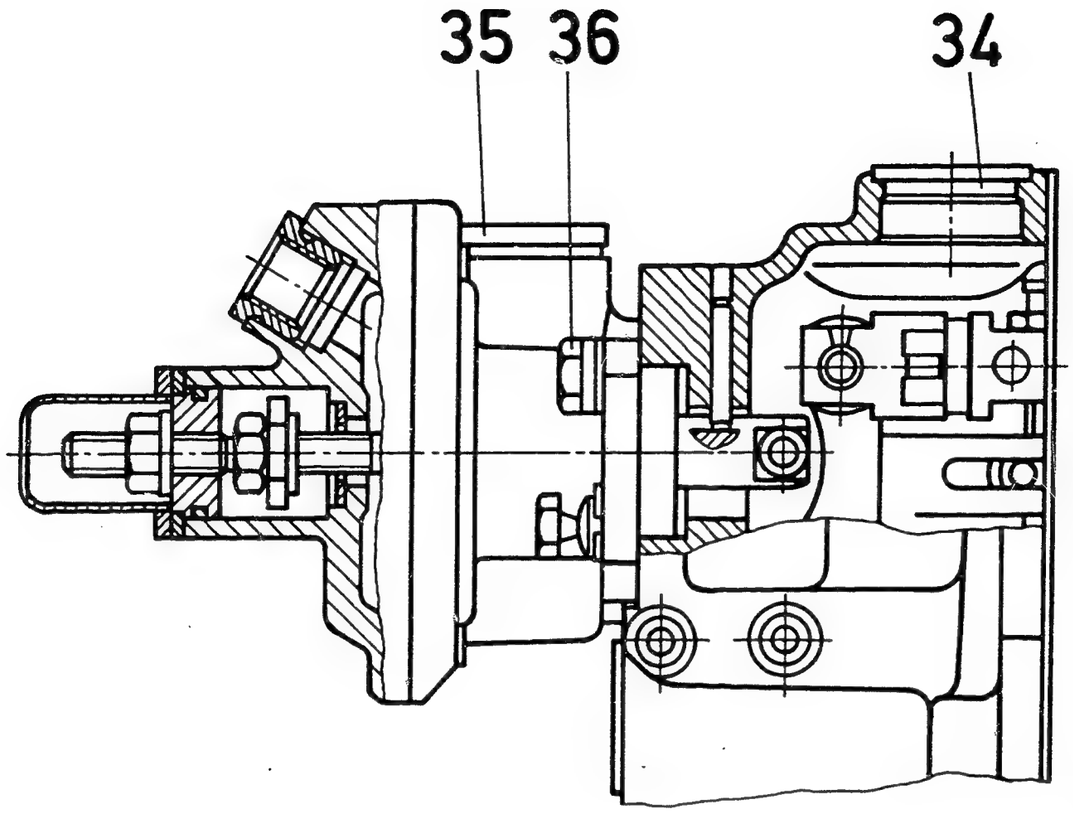


400/083

TIGHTENING TORQUES FOR BOSCH IN-LINE PUMPS AND DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

Item	Coordinates
9	F16/F17
27	F21
28	F21
29	F21

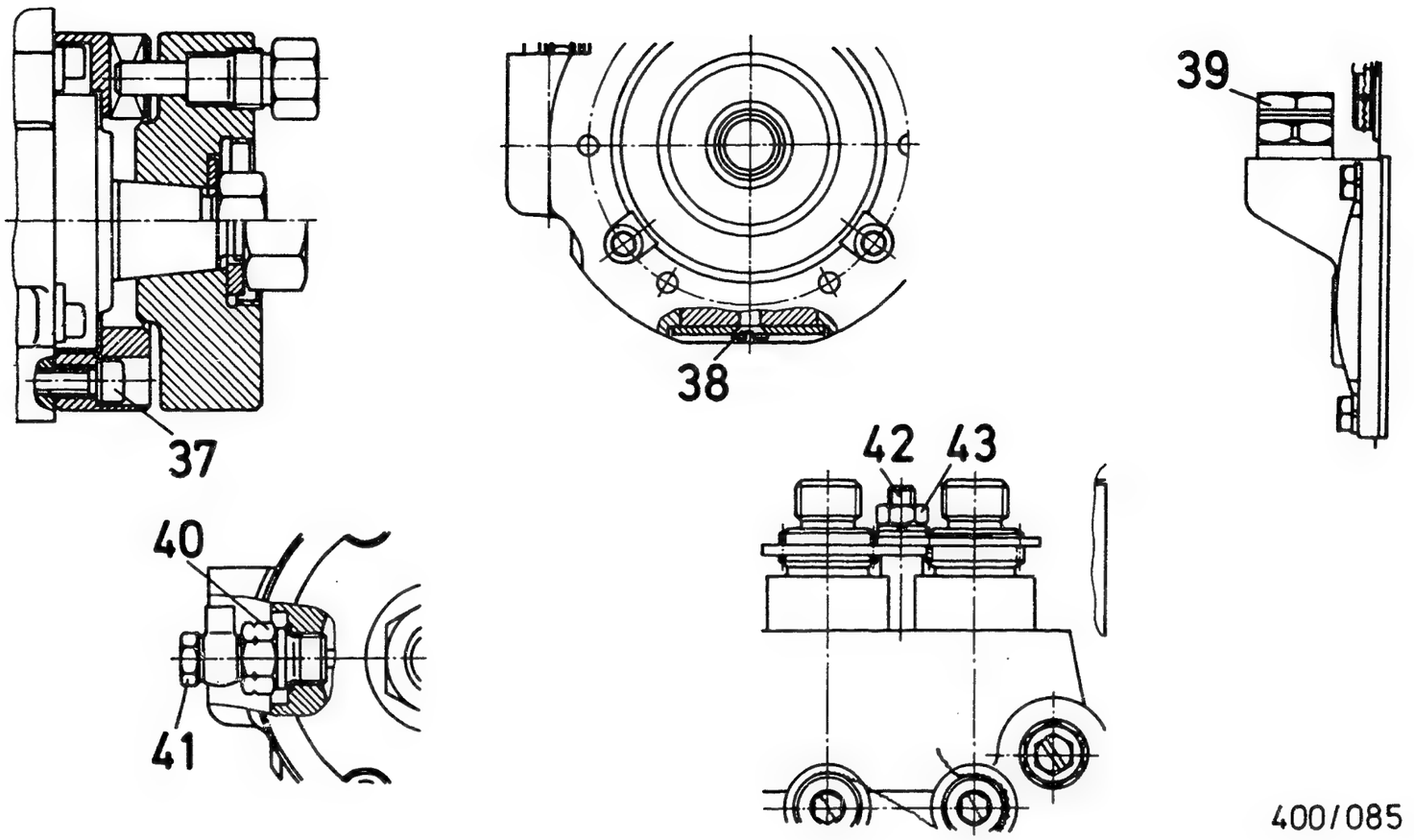
Item	Coordinates
30	F22
31	F22
32	F22
33	F22



400/084

TIGHTENING TORQUES FOR BOSCH IN-LINE PUMPS AND DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

Item.....	Coordinate
34	F22
35	F22
36	F22

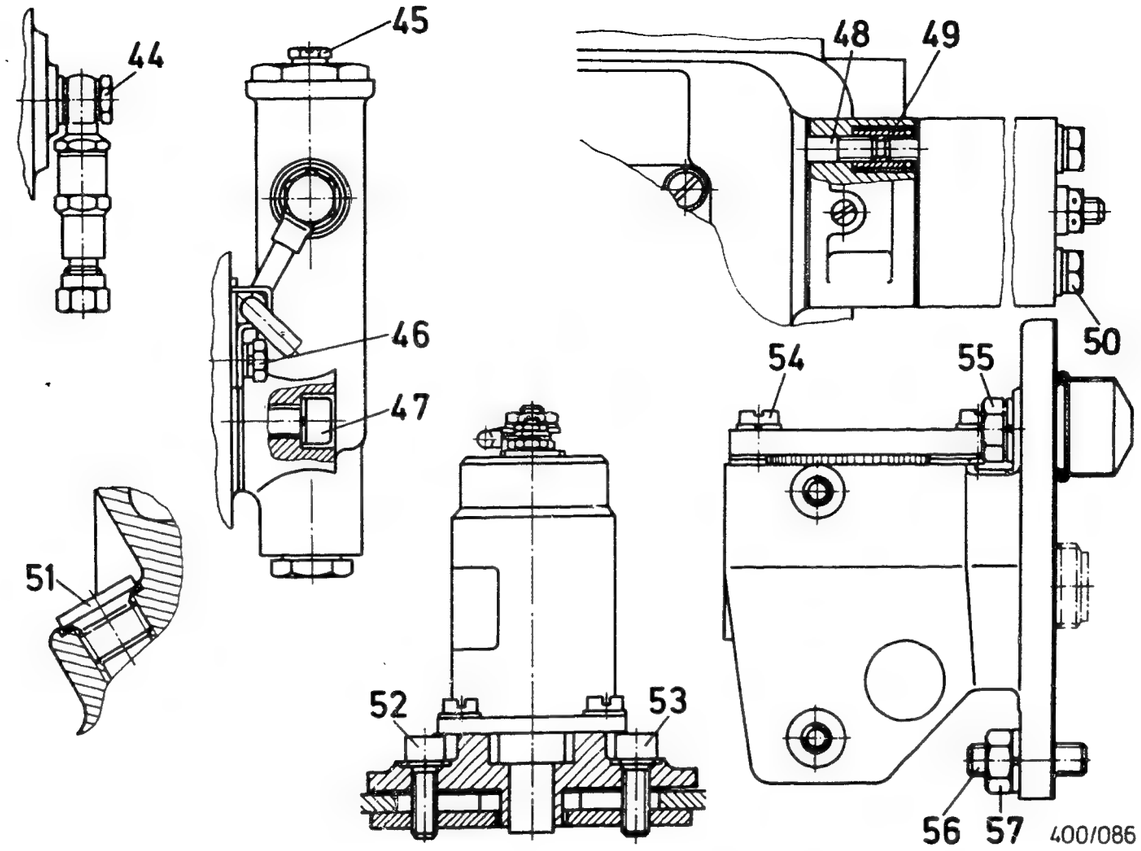


400/085

TIGHTENING TORQUES FOR BOSCH IN-LINE PUMPS AND DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

Item	Coordinates
37	F23
38	F23
39	F23

Item	Coordinates
40	F23
41	F23
42	F23
43	F23



TIGHTENING TORQUES FOR BOSCH IN-LINE PUMPS AND DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

Item	Coordinates
44	F23
45	F23
46	F23
47	F23
48	F23
49	F23
50	F23

Item	Coordinates
51	F23
52	F23
53	F23
54	F23
55	F23
56	F23
57	F23

TIGHTENING TORQUES FOR PE(S).. A.., B.., Z.., PF..

Item 1 – Delivery-valve holder

Model	Housing made of	Steel/copper-reinforced fibre seal rings Nm	Double seal: Delivery-valve holder with no identification groove Nm	Double seal: Delivery-valve holder with identification groove Nm	Nylon seal rings Nm	Solid copper seal rings Nm
PE(S)..A..C..	Al	–	45–0–45–0–45...50	–	45...50	–
PE(S)..A..D..	Al	–	–	40–0–40–0–40...45 *	–	–
				30–0–30–0–33...37 **	–	
PE(S)..B..	Al	35... 45	45–0–45–0–45...50	–	45...50	–
PE..BV..	Al	45... 55	–	–	–	–
PE..Y..	Al	–	–	–	150–0–120	–
PE..Z..	Al	–	120–0–90	–	120–0–120	200–0–200–0–150...200
PE..CM..		–	200–0–150	–	–	–
PE..ZW(M).., ZV.. (up to S 2999)	Al, GCI	–	120–0–90	–	90–0–90...95 0–120	–
PE..ZW(M).. (as of S 3000)	Al	–	200–0–190...200	–	–	200–0–190...200
PE..C..		–	250–0–200...250	–	–	–
PF..A..	Al	35... 45	–	30–0–30–0–30...35	45...50	–
	GCI	–	–	35–0–35–0–35...40	50...55	–
PF..B..	GCI	60... 70	–	–	50...55	–
PF1C..	CI	–	–	–	–	250–0– 250–0– 200... 250
PF1CV..	CI	–	–	–	–	450–0– 450–0– 450... 500
PF1D..	CI	–	–	–	–	550–0– 550–0– 450... 500
PF1DV..	CI	–	–	–	–	1000–0–1000–0–1000...1050
PF1E..	CI	–	–	–	–	600–0– 600–0– 500... 550
PF..K..	Al	30... 40	–	–	–	–
PF1W..	CI	–	500–0–500–0–400...450	–	–	500–0– 500–0– 400... 450
PF..Z..	CI	120...150	–	–	150–0–120	200–0– 200–0– 150... 200
PFR..A..	CI	60... 70	45–0–45–0–45...50	35–0–35–0–35...40	50...55	–
PFR..K..	CI	50... 60	35–0–35–0–35...40	35–0–35–0–35...40	50...55	–
PFE1Q..	CI	–	35–0–35–0–35...40	–	–	–

* = for PE(S) 2... 6A..D..
** = for PE(S) 8...12A..D..

TIGHTENING TORQUES FOR PE(S).. A.., B.., Z.., PF..
(CONTINUED)

Item 2 – Bleeder screws

Model	Thread	Nm
For all pumps	M 6	4... 5
PF..	M 10 x 1	20...25

Item 3 – Threaded bushing 20...30 Nm

Item 4 – Positioning screw for plunger–and–barrel assembly, baffle screws

Model	Thread	Nm
PE(S).. A.., B..	M 6	7... 9
PE..Z.., Y..	M 8	20... 24
PE..ZWM..	M 10	25... 30
	M 14 x 1.5	40... 45
	M 16 x 1.5	40... 50
PF..A.., B..	M 6	7... 9
PF..C.., Z..	M 8	20... 24
PF..D.., W.., CV..	M 10	40... 60
PF..E..	M 12 x 1.5	70... 90
PF..V..	M 26 x 1.5	120...150
PF1C.., CV..	M 16 x 1.5	80...100
PF1W(V).., D(V)..	M 18 x 1.5	100...120
PF1D.., E..	M 26 x 1.5	130...150
Baffle screws (micro–encapsulated)		
PE(S)..A..	M 8	15... 20

TIGHTENING TORQUES FOR PE(S).. A.., B.., Z.., PF..
(CONTINUED)

Item 5 – Control–rod guide bushing

Model	Tightening torque Nm	Test torque Nm
one–piece		
PF..K..	30...40	25
PF..A.., PF..B..	30...40	25
PE(S)..A..	40...60	30
two–piece		
PE(S).. A..	15...20	–

Item 6 – Closure cap
IP, general 10 Nm
ZWM.. 20...30 Nm

Item 7 – Fastening screws for spring–chamber cover

Model	Thread	Nm
PE(S)..A.., B..	M 6	4...5
PE..Z..	M 6	4...6
PE(V)..ZW(M)..	M 6	4...6

Item 8 – Reducer bushing 20...25 Nm

Item 9 – Timing device and couplings (Drive end)

Model	Cone dia.	Thread	Nm
PE(S)..A..	17 mm	M 12	60... 70
	20 mm	M 14 x 1.5	80... 90
PES4A.. (Ford)	20 mm	M 14 x 1.5	60... 70
PES6A..			
PE8A.. (MAN)	25 mm	M 18 x 1.5	100...110
PE10A..			
PE(S)..B..	17 mm	M 12	60... 70
	20 mm	M 14 x 1.5	85...100

Item 9 – Timing device and couplings
(Drive end)
(continued)

Model	Cone dia.	Thread	Nm
PE..BV..	20 mm	M 14 x 1.5	85...100
	25 mm	M 18 x 1.5	130...150
PE(V)..Z..ZW1	30 mm	M 20 x 1.5	200...240
PE..Y..	25 mm	M 18 x 1.5	130...150
	35 mm	M 24 x 1.5	250...300
	40 mm	M 28 x 1.5	300...350
	45 mm	M 32 x 1.5	400...450
(Output end)			
PE..ZW(M)..	25 mm	M 18 x 1.5	200...225
	35 mm	M 24 x 1.5	200...225

Item 10 – Fastening screws for bearing end plate

Model	Thread	Nm
PE(S)..A..B..	M 6	7... 9
PE(S)..A.., Z..	M 8	11... 16
	M 6	15... 18
PEV..ZWM..	M 8	20... 24
PE..Y..	M 10	32... 46

Item 11 – Threaded pin

Model	Nm
For all pumps	3...4

Item 12 – Hexagon nut

Model	Thread	Nm
with paper seal		
PE(S)..A..	M 6	7...10
PE(S)..B.., Z..	M 6	5... 7
with rubber seal		
PE..Z..	M 6	3... 4
PE..CM..	M 8	7... 9

Item 13 – Fillister-head screw for intermediate bearing

Model	Thread	Nm
PE(S).. A..	M 5	3.5...5.5
all IP	M 6	7.0...9.5
PEV..ZWM	M 8	20... 24

Item 14 – Base-cover screws

Model	Thread	Nm
PE(S).. A..	M 26 x 1.5	55... 75
PE(S).. B..	M 35 x 1.5	55... 75
PE..Z..	M 38 x 1.5	55... 75
PEV..ZWM..	M 40 x 1.5	110...120
PE..Y..	M 45 x 1.5	80...100

Item 15 – Hexagon nut for roller tappet

Model	Thread	Nm
PE(S)..A.., B..	M 9 x 1	15...25
PE.. BV..	M 10 x 1.5	25...30
PE..ZW.., ZWM..	M 14 x 1.5	60...70

TIGHTENING TORQUES FOR PE(S).. A.., B.., Z.., PF..
(CONTINUED)

Item 16 – Fastening screws for governor cover

Model	Thread	Nm
RSV.., RQ.., RQV..	M 6	5... 7
	M 8	11... 16
EP/M.., MN.., MZ..	M 5	4.5...5.5
RQU(V)..	M 8	13... 18

Item 17 – Mechanical governor

Model	Cone dia.	Thread	Nm
Size A	17 mm	M 12	50... 60
Size B	20 mm	M 14 x 1.5	60... 70
Size Z (WM)	25 mm	M 18 x 1.5	150...170

Item 18 – Governor fastening screws

Model	Thread	Flat-head screw Nm	Fillister-head screw Nm
PE(S)..A..	M 6	6... 8	6... 8
PE(S)..B..	M 6	6... 8	15...18
PE..Z..	M 8	13...18	–
PE..ZW(M)..	M 8	–	10...13 (Nut)
	M 8	–	11...15 (Nut)

Item 19 – Control lever

Fastening screw	7... 9 Nm
Clamping screw (RQU(V)..)	7... 9 Nm
Clamping screw	11...13 Nm

TIGHTENING TORQUES FOR PE(S).. A.., B.., Z.., PF..
(CONTINUED)

Item 20 – Governor screw plugs

Model	Thread	Nm
RSV..	M 10 x 1	10...12
RQ.., RQV..	M 38 x 1.5	30...40
RQU(V)..	M 6	5... 7

Item 21 – Governor fastening screws

Type of screw	Thread	Nm
Flat-head screws	M 8	13...18
with micro-encapsulation	M 8	18...23
Hexagon bolts	M 8	18...20
Fillister-head screws	M 8	11...16
Hexagon bolts (RQU(V)..)	M 8	11...16

Item 22 – Screw plugs

Model	Part no.	Thread	Nm
PE(S)..A..	1 423 463 040	M 18 x 1.5	40... 50
PF2A..	1 413 463 090	M 18 x 1.5	35... 40
PE(S)..B, Z..	1 423 463 050	M 24 x 1.5	80...100
PE..ZW(M)..	–	M 18 x 1.5	25... 42

Item 23 – Clamping screw at ring gear

Model	Thread	Nm
PE(S)..A.., B..	M 4.5	3...4
PE..Z.., ZW.., BV..	M 4.5	5...6
PE..Y.., CM..	M 6	7...9

TIGHTENING TORQUES FOR PE(S).. A.., B.., Z.., PF..
(CONTINUED)

Item 24 – Union nut (with fuel-injection tubing)

Model	Thread	Nm
PE(S)..A..B..	M 12 x 1.5	max. 25
PE(S)..B(V)..	M 14 x 1.5	max. 25
PE..Z.., Y.., PF1C..	M 18 x 1.5	40...60
PE..CM.., PF1CV.., W..	M 22 x 1.5	40...60
PE..Z..	M 20 x 1.5	45...65

Item 25 – Control-rod positioning screw

Model	Thread	Nm
PE(S)..A..	M 6	5... 6
PE(S)..B.., Z..	M 6	10...14
PE..Y.., CM.., ZW(M)..	M 8	10...16
PF1C.., CV.., W..	M 8	10...15
PF1D.., E..	M 10	20...30

Item 26 – Fillister-head screw	5...6.5 Nm
Item 27 – Hexagon nut	35...40 Nm
Item 28 – Screw plugs	30...40 Nm

Item 29 – Cover at timing device

Model	Thread	Nm
2-spring version		
EP/SA..	M 124 x 1.5	180
EP/SB.., SD..	M 160 x 1.5	220
4-spring version		
Hexagon bolt	M 8	22...24
Hexagon-socket-head cap screw	M 8	10...12

TIGHTENING TORQUES FOR PE(S).. A.., B.., Z.., PF..
(CONTINUED)

Item 30 – Hexagon bolt	18...20 Nm
Item 31 – Hexagon-socket-head cap screw	25...30 Nm
Item 32 – Cap nut	55...65 Nm (PF..)
Item 33 – Stop pin	4 Nm (PF..)
Item 34 – Screw plug	
RSV..	30...40 Nm
RQ.., RQV..	25...30 Nm
RQU(V)..	20...30 Nm
Item 35 – Screw plug Manifold-pressure compensator	0...35 Nm
Item 36 – Hexagon bolt Manifold-pressure compensator	5... 7 Nm
Item 37 – Hexagon-socket-head cap screw	20...24 Nm
Item 38 – Flat-head screw	4...5 Nm
Item 39 – Screw plug	25...42 Nm
Item 40 – Threaded bushing	45...55 Nm
Item 41 – Inlet-union screw	8...12 Nm
Item 42 – Headless setscrew	10...13 Nm
Item 43 – Hexagon nut	11...15 Nm

Item 44 – Inlet–union screw	14...16 Nm
Item 45 – Bleeder screw	4...5 Nm
Item 46 – Hexagon bolt	5...7 Nm
Item 47 – Hexagon–socket–head cap screw	20...24 Nm
Item 48 – Headless setscrew	2...4 Nm
Item 49 – Threaded bushing	7...9 Nm
Item 50 – Cheese–head screw	7...9 Nm
Item 51 – Screw plug	20...30 Nm
Item 52 – Hexagon–socket–head cap screw	7...9 Nm
Item 53 – Cheese–head screw	3...4 Nm
Item 54 – Cheese–head screw	3...4 Nm
Item 55 – Hexagon bolt	8...10 Nm
Item 56 – Headless setscrew	10...13 Nm
Item 57 – Hexagon nut	11...15 Nm

For production reasons:
continued on the following
coordinate.

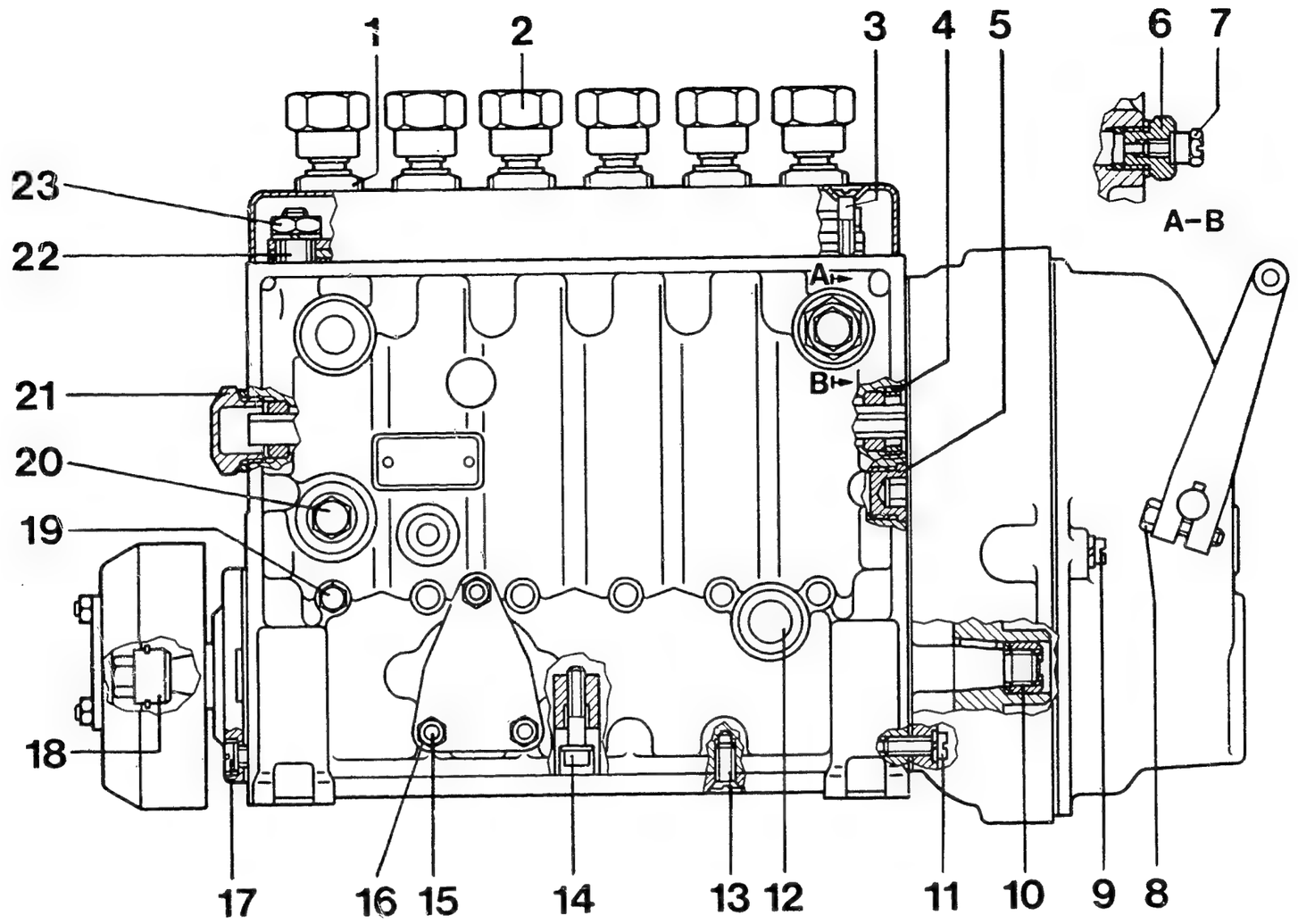
2.2 TIGHTENING TORQUES FOR PE(S)..M(W).., P..FUEL-INJECTION PUMPS

The applicable tightening torques for fuel-injection pumps are given on the following Coordinates.

Bolts, screws, nuts etc. are indicated on the drawings on the following Coordinates G03...G10.

These items are repeated at the bottom of the list with an indication being given of the Coordinates under which the tightening torque is to be found.

For production reasons: continued on the following coordinate.



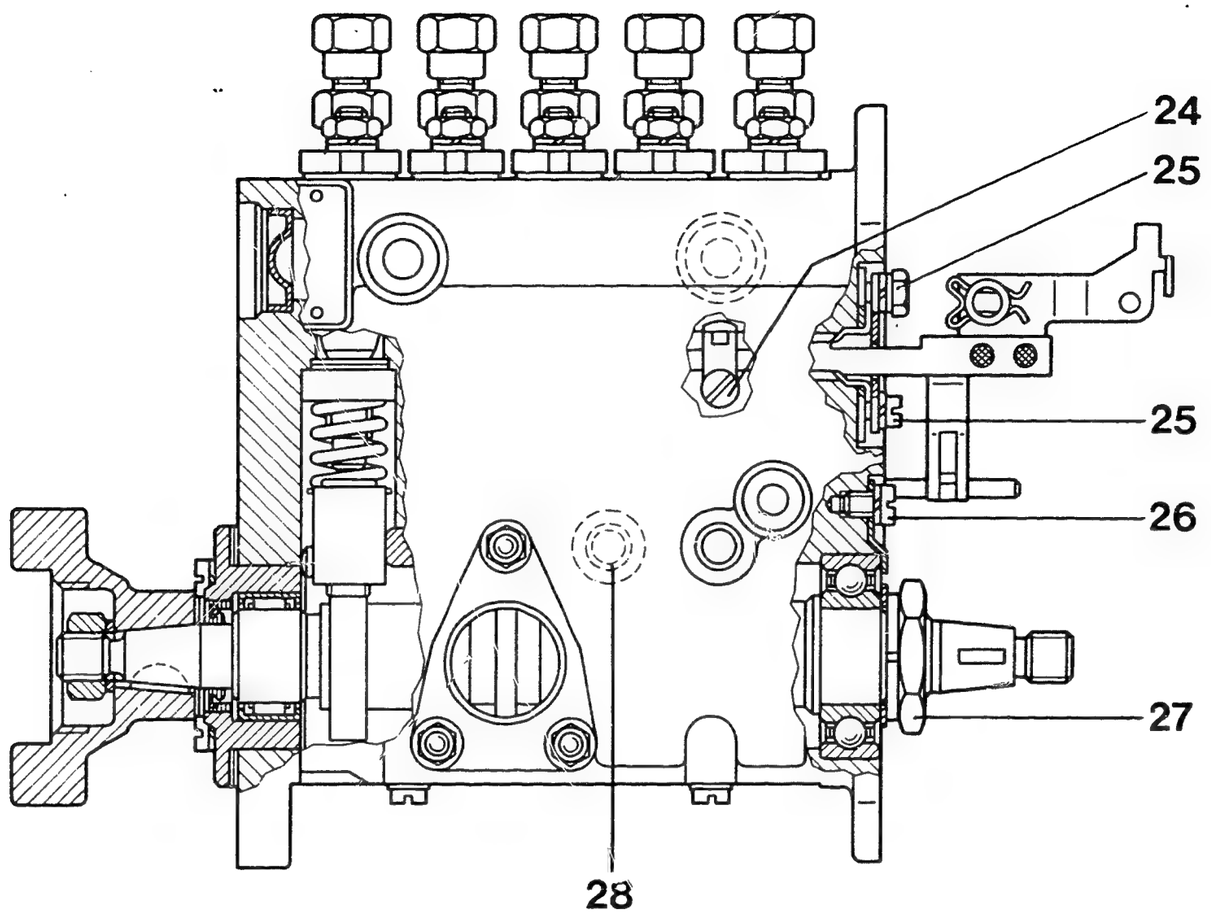
400/087

TIGHTENING TORQUES FOR PE(S)..M(W).., P..FUEL-INJECTION PUMPS (CONTINUED)

Item	Coordinates
1	G11
2	G11
3	G11
4	G11
5	G11
6	G11
7	G11
8	G11

Item	Coordinates
9	G12
10	G12
11	G12
12	G13
13	G13
14	G13
15	G13
16	G13

Item	Coordinates
17	G14
18	G14
19	G14
20	G14
21	G15
22	G15
23	G15

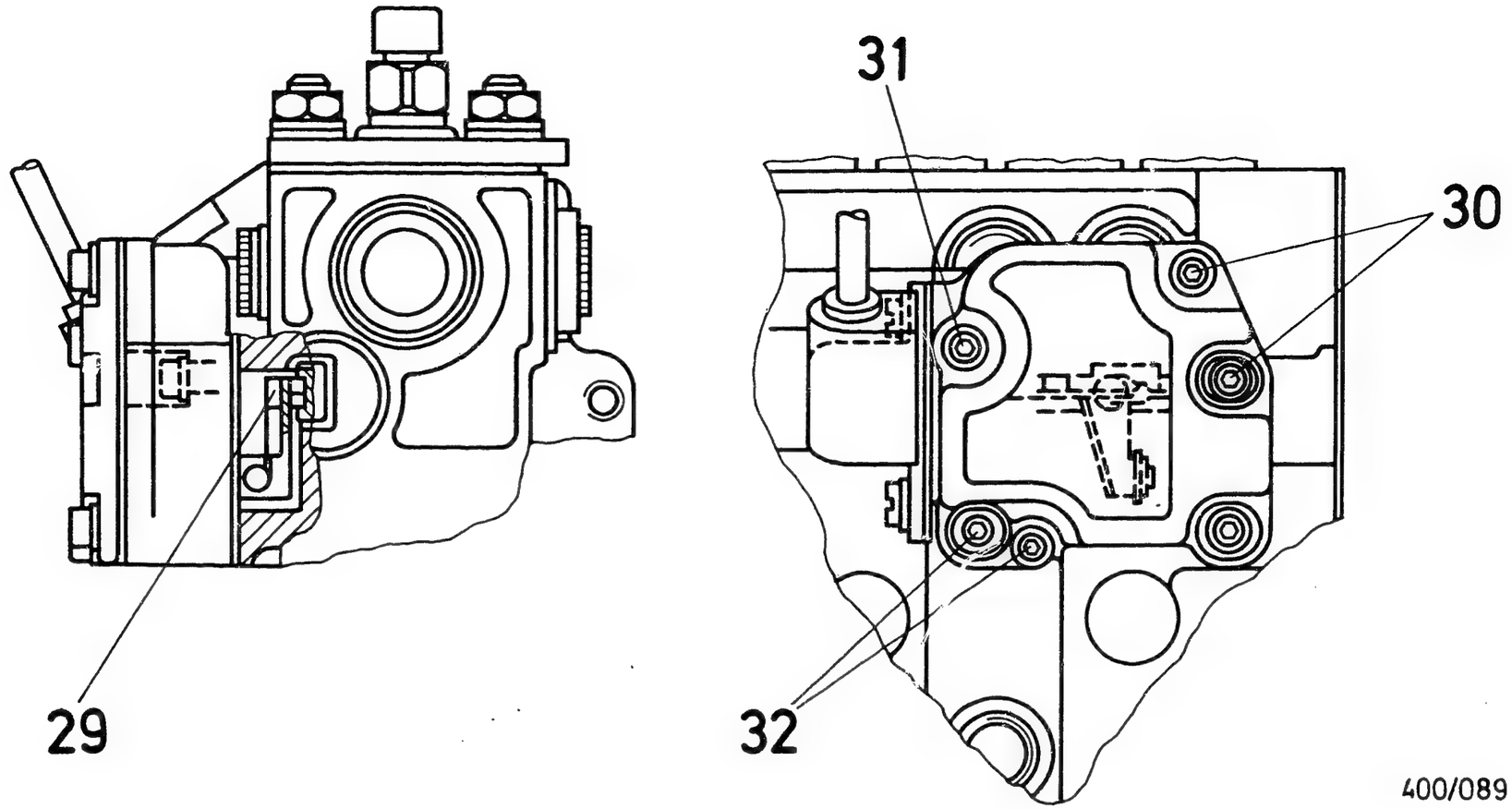


400/088

TIGHTENING TORQUES FOR PE(S)..M(W).., P..FUEL-INJECTION PUMPS (CONTINUED)

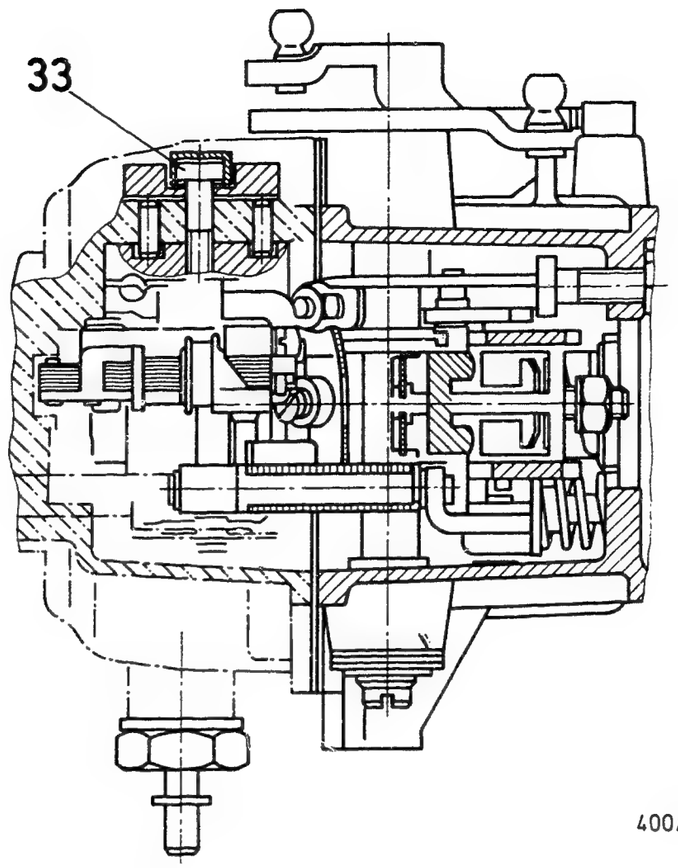
Item	Coordinates
24	G15
25	G15
26	G15

Item	Coordinates
27	G15
28	G15



TIGHTENING TORQUES FOR PE(S)..M(W).., P..FUEL-INJECTION PUMPS (CONTINUED)

Item	Coordinates
29...32	G16



400/090

TIGHTENING TORQUES FOR PE(S)..M(W).., P..FUEL-INJECTION PUMPS (CONTINUED)

Item	Coordinates
33	G16

TIGHTENING TORQUES FOR PE(S)..M(W).., P..
(CONTINUED)

Item 1 – Delivery-valve holder

Model	Thread	Nm
PES..M..	M 18 x 1.5	30–0–30–0– 30...35
PE(S)..MW..	M 16 x 1.5	50...60
PE(S)..P../..	M 26 x 1.5	65...80
PE(S)..P..A..	M 26 x 1.5	60–0–60–0– 80...90
PE(S)..P..S 600...		
S 7000..	M 22 x 1.5	110...120

Item 2 – Union nut

Model	Thread	Nm
PES..M..	M 12 x 1.5	max. 25
PE(S)..MW..	M 12 x 1.5	max. 25
PE(S)..P..	M 14 x 1.5	max. 25

Item 3 – Flat-head screw 2... 3 Nm

Item 4 – Control-rod guide bushing 30...40 Nm

Item 5 – Screw plug

Model	Nm
PES..M..	30...35
PE(S)..P..	40...50

Item 6 – Threaded bushing 20...30 Nm

Item 7 – Bleeder screw 4... 5 Nm

Item 8 – Control-lever

fastening screw	RSV	7... 9 Nm
clamping screw	RQ(V)	11...13 Nm

TIGHTENING TORQUES FOR PE(S)..M(W).., P..
(CONTINUED)

Item 9 – Governor-cover fastening screw

Model	Thread	Nm
RSV.., RQ.., RQV..	M 6	5... 7
	M 8	11...16
RSF..	M 6	5... 7
RW(V)..	M 6	4... 5
EP/MN.., MZ..	M 5	4.5...5.5

Item 10 – Mechanical governor

Model	Fitted to	Thread	Nm
RSV.., RSF..	PES.. M..	M 12	50... 60
RQ(V).. RSV	PE(S)..MW..	M 12	50... 60
RW(V)..	PE(S)..MW..	M 12 x 1	100...110
RQ(V).., RSV..	PE(S)..P..	M 12 *	50... 60
		**	65... 75

Item 11 – Governor fastening screw

Model	Thread	Nm
PE(S)..MW..	M 6	8...11
PE(S)..P..		
for flat-head screws	M 6	6... 8
for fillister-head screws	M 6	7... 9

* = Flyweight assemblies with lubricating coil and hole at driver, and no holes in Cardan universal joint

** = Flyweight assemblies with no lubricating coil and hole at driver, and with two holes in Cardan universal joint.

Item 12 – Reducer bushing

	Thread	Nm
	M 14 x 1.5	20...25
	M 16 x 1.5	30...40

Item 13 – Fastening screw for base cover

Model	Thread	Nm
PES..M..	M 6	5... 7
PE(S)..MW..	M 6	5... 9
PE(S)..P..	M 6	6... 7
	(Flat-head screw with slot)	
	M 6	7... 9
	(Flat-head screw with hexagon socket)	
	M 6	7... 9
	(Fillister-head screw with hexagon socket)	

Item 14 – Fillister-head screw for intermediate bearing

Model	Thread	Nm
PE(S)..MW..	M 6	8...10
PE(S)..P..	M 6	7... 9
	for aluminium bearing	
		8...10
	for steel bearing	

Item 15 – Threaded pin

Model	Thread	Nm
PES..M..MW..	M 6	3...4
PE(S)..P..	M 6	3.5...4.5

Item 16 – Hexagon nut

Model	Thread	Nm
PES..M..	M 6	5... 7
PE(S)..MW..	M 6	4... 7
PE(S)..P..	M 6	7... 9

Item 17 – Fastening screw for bearing end plate

Model	Thread	Nm
PES..MW.., P..	M 6	9...12
	Fillister-head screw	
	M 6	10...12
	Fill.-head Torx screw	
	M 8	18...20
	Fill.-head Torx screw	
	M 6	10...12
	Hex.-socket-head cap screw	
	M 8	18...20
	Hex.-socket-head cap screw	
PE(S)..MW..	M 6 (Z)	7... 9
	M 6 (I)	12...15
		(Torx)
	M 8	11...16

Item 18 – Timing device and couplings

Model	Cone dia.	Thread	Nm
PES..M..	17 mm	M 12	40... 60
	20 mm	M 14 x 1.5	85...100
PE(S)..MW..			
PE(S)..P..	17 mm	M 12	60... 70
Round nut	20 mm	M 14 x 1.5	85...100
	25 mm	M 18 x 1.5	100...110
Hexagon nut	20 mm	M 14 x 1.5	65... 75
	25 mm	M 18 x 1.5	100...110
	30 mm	M 20 x 1.5	150...170
	35 mm	M 24 x 1.5	170...200

Item 19 – Screw plug 8...10 Nm

Item 20 – Screw plug

Model	Thread	Nm
PE(S)..MW..	M 18 x 1.5	30...40
PE(S)..P..	M 24 x 1.5	40...60

TIGHTENING TORQUES FOR PE(S)..M(W).., P..
(CONTINUED)

Item 21 – Screw plug

Model	Thread	Nm
PES..M..	M 14 x 1.5	10
PE(S)..P..	M 24 x 1.5	40...60
PE(S)..MW..	M 26 x 1.5	45...55

Item 22 – Headless setscrew

Model	Thread	Nm
PE(S)..MW..	M 8	8...13
PE(S)..P..	M 10	25...30

Item 23 – Hexagon nut

Model	Thread	Nm
PE(S)..MW..	M 8	20...25
PE(S)..P..	M 10	40...45

Item 24 – Clamping screw 3...5 Nm

Item 25 – Control-rod fastening screw 4...7 Nm

Item 26 – Fillister-head screw 4...7 Nm

Item 27 – Hexagon nut 100...120 Nm

Item 28 – Screw plug 30... 40 Nm

Item 29 – Micro-encapsulated screw 2... 3 Nm

Item 30 – Micro-encapsulated fillister-head Torx screw 3... 4 Nm

Item 31 – Micro-encapsulated fillister-head Torx screw 3... 4 Nm

Item 32 – Micro-encapsulated fillister-head Torx screw 3... 4 Nm

Item 33 – Micro-encapsulated fillister-head Torx screw 7...10 Nm

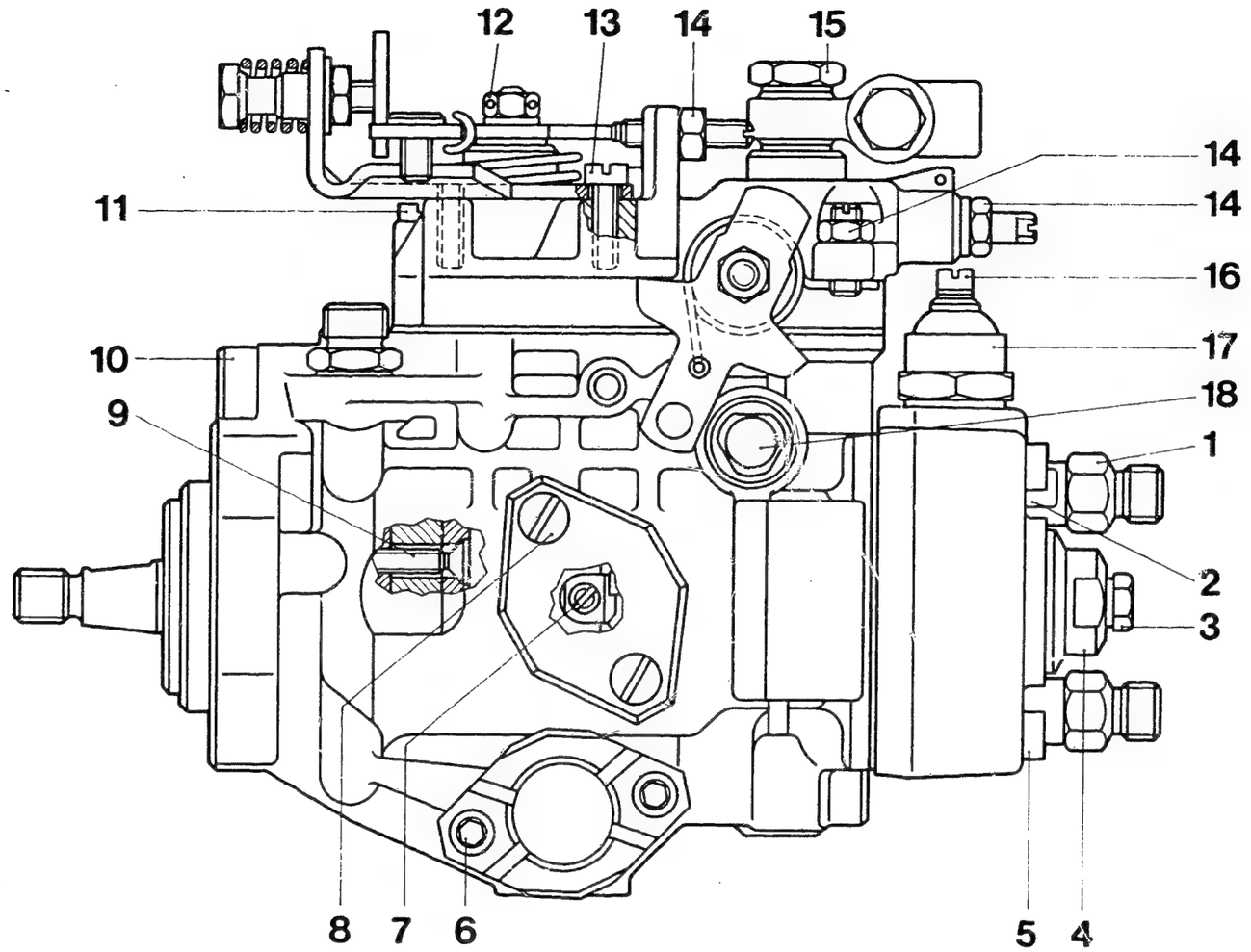
2.3 TIGHTENING TORQUES FOR BOSCH-VA.., VE..- DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS

The applicable torques for fuel-injection pumps are given on the following Coordinates.

Bolts, screws, nuts etc. are indicated on the drawings on the following Coordinates H03...H16.

These items are repeated at the bottom of the list with an indication being given of the Coordinates under which the tightening torque is to be found.

For production reasons: continued on the following coordinate.



400/091

TIGHTENING TORQUES FOR BOSCH-VA.., VE..DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

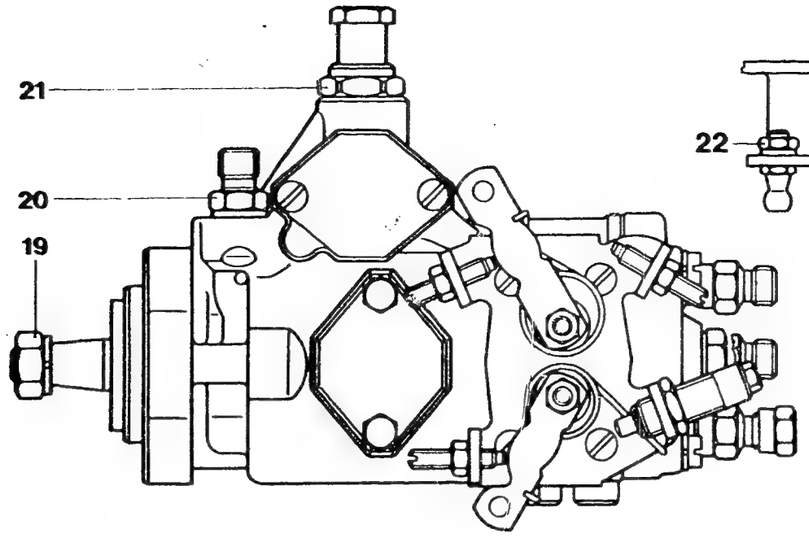
Item	Coordinates
1	H17
2	H17
3	H17
4	H17
5	H17
6	H18

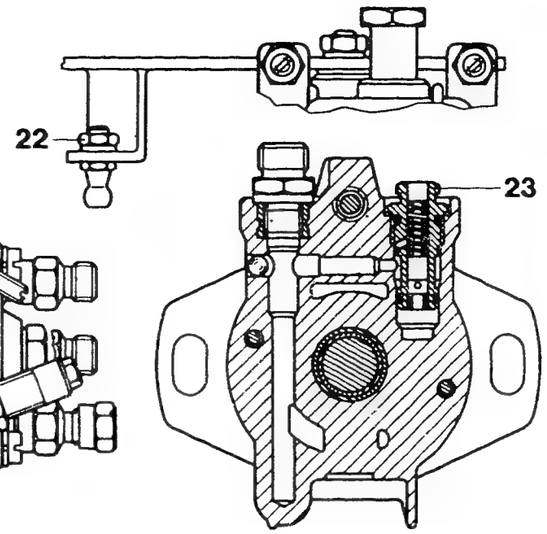
Item	Coordinates
7	H18
8	H18
9	H18
10	H18
11	H18
12	H18

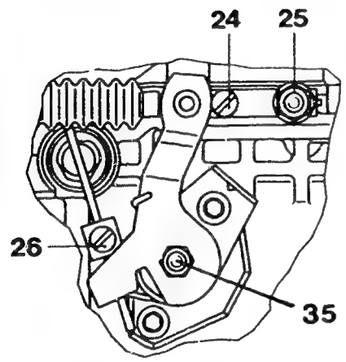
Item	Coordinates
13	H19
14	H19
15	H19
16	H19
17	H19
18	H19

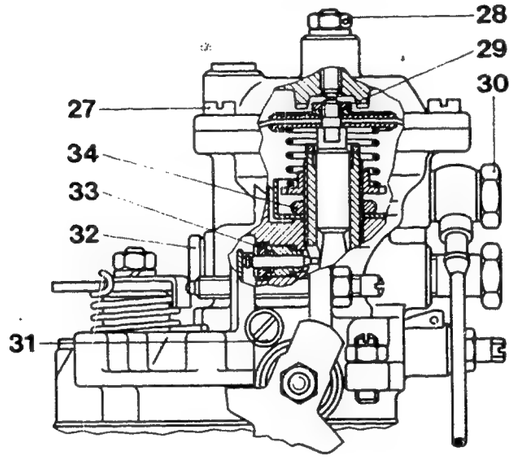
H03 — 70==>

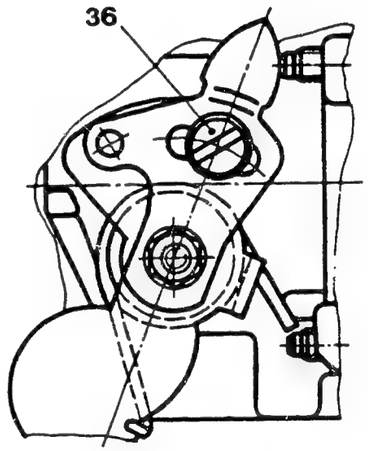
H04 — <==>











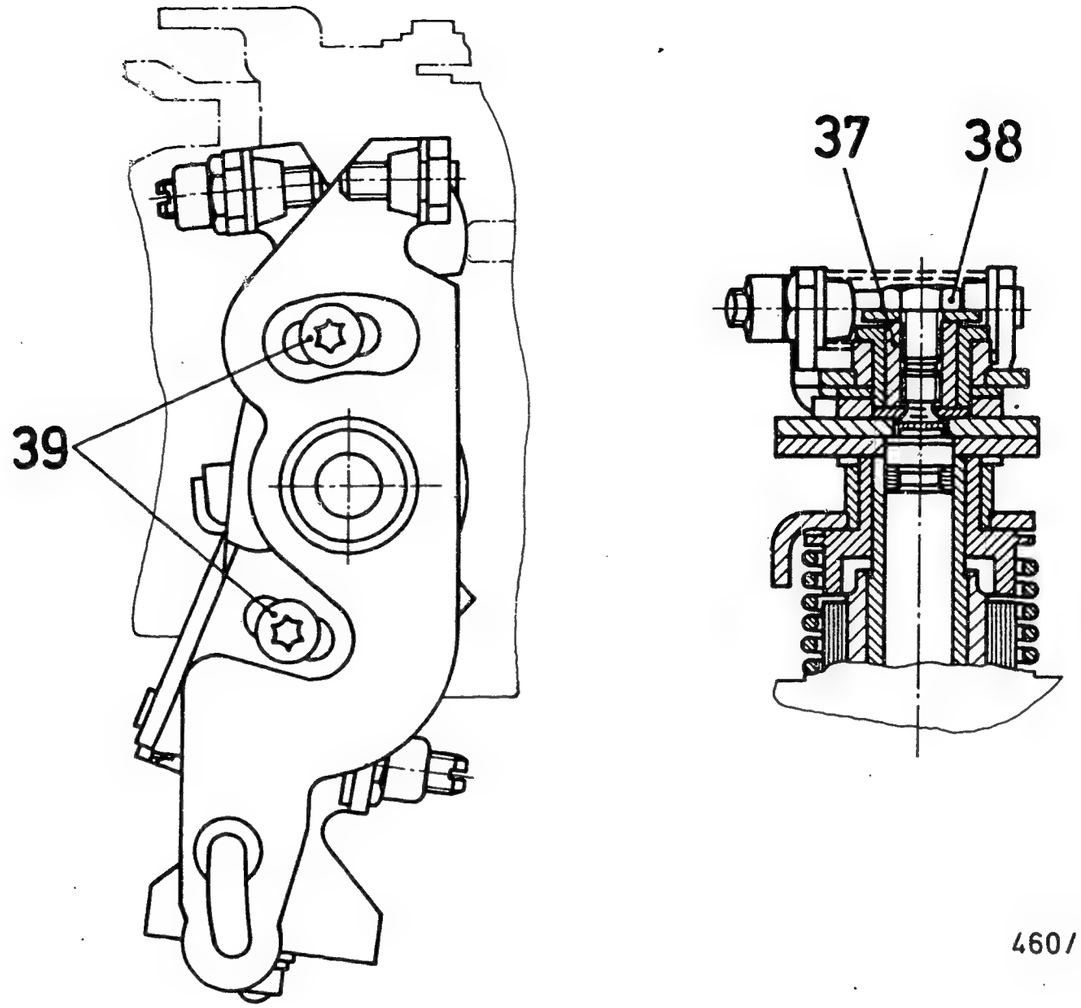
400/092

TIGHTENING TORQUES FOR BOSCH-VA.., VE..DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

Item	Coordinates
19	H19
20	H20
21	H20
22	H20
23	H20
24	H20

Item	Coordinates
25	H20
26	H20
27	H20
28	H20
29	H20
30	H20

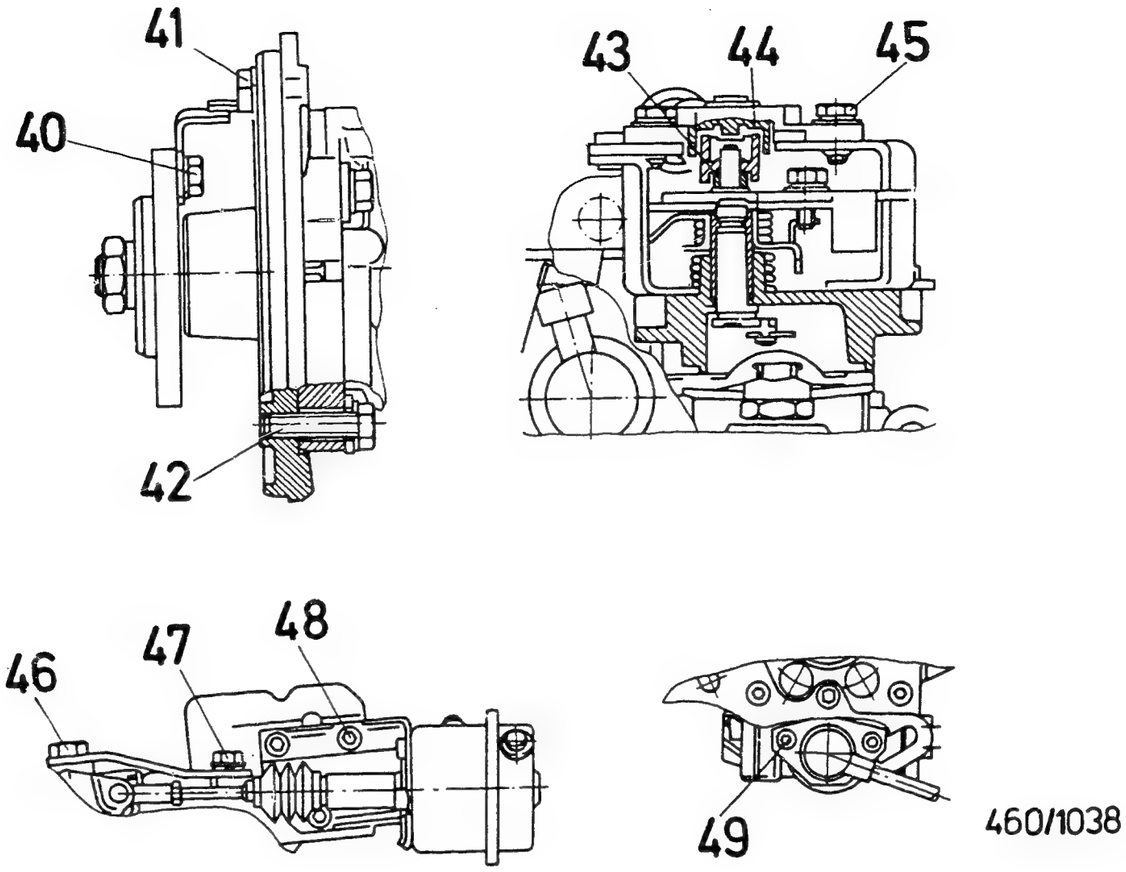
Item	Coordinates
31	H20
32	H20
33	H20
34	H20
35	H20
36	H21



460/2003

Item	Coordinates
37	H21
38	H21
39	H21

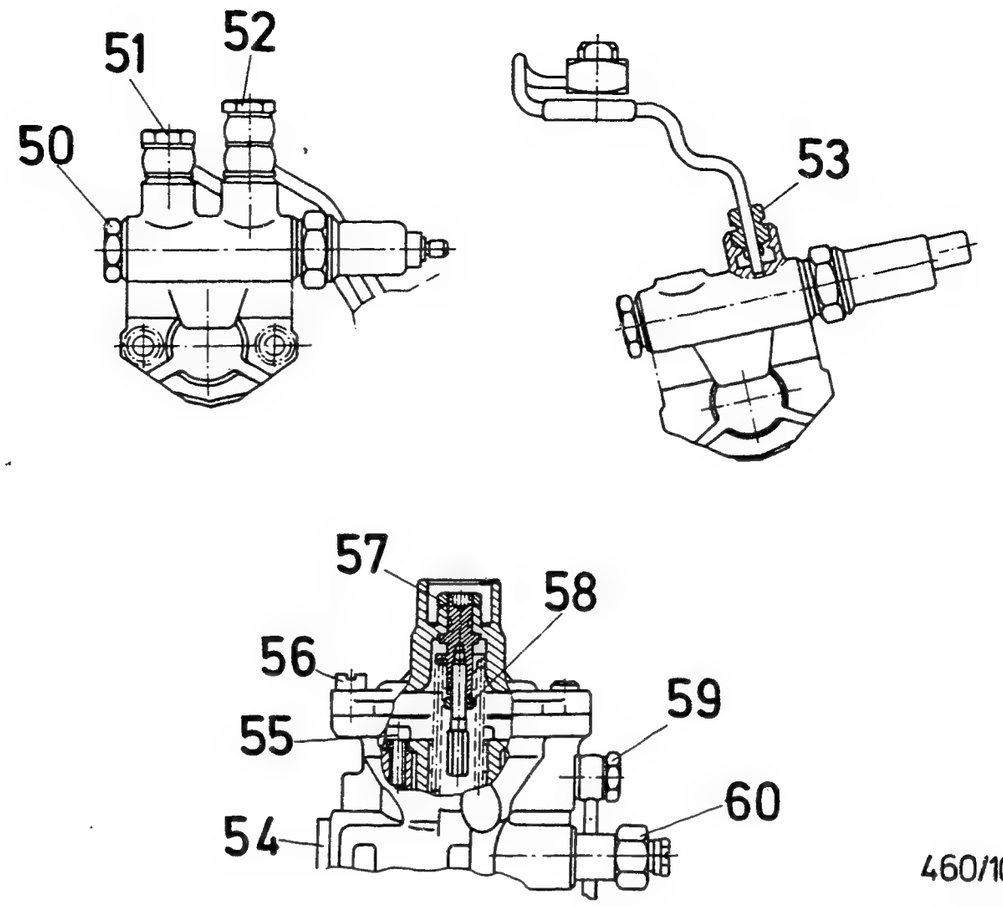
TIGHTENING TORQUES FOR BOSCH-VA.., VE..DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)



TIGHTENING TORQUES FOR BOSCH-VA.., VE..DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

Item	Coordinates
40	H21
41	H21
42	H21
43	H21
44	H21

Item	Coordinates
45	H21
46	H21
47	H21
48	H21
49	H21

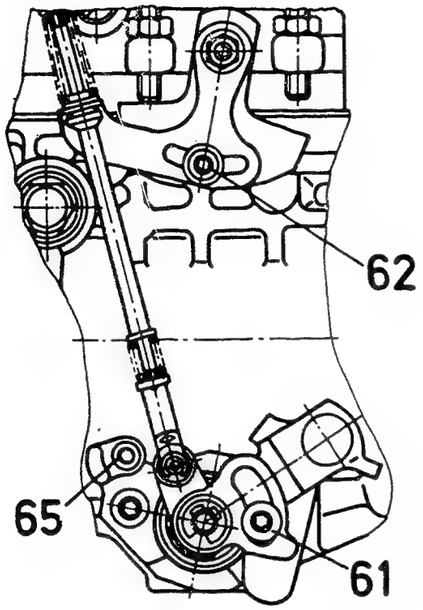


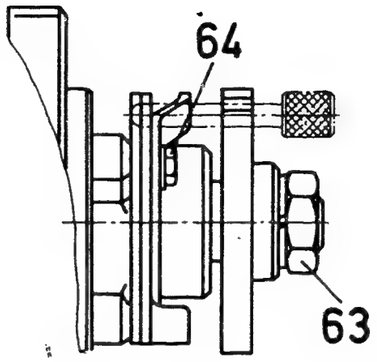
460/1039

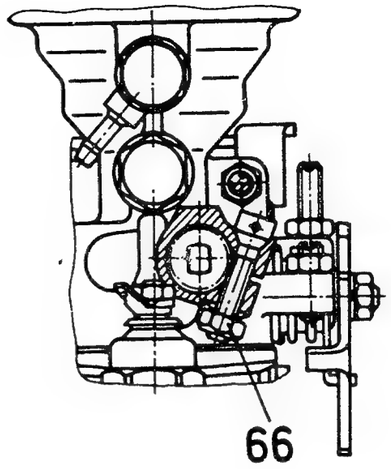
TIGHTENING TORQUES FOR BOSCH-VA.., VE..DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

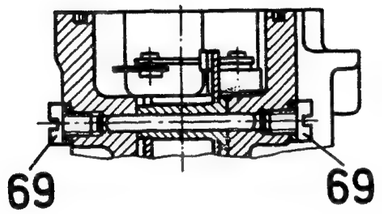
Item	Coordinates
50	H21
52	H21
52	H21
53	H21
54	H21
55	H21

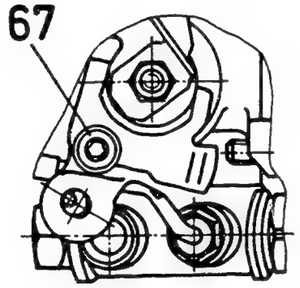
Item	Coordinates
56	H21
57	H21
58	H22
59	H22
60	H22

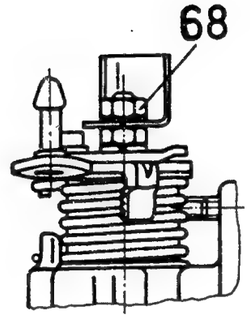










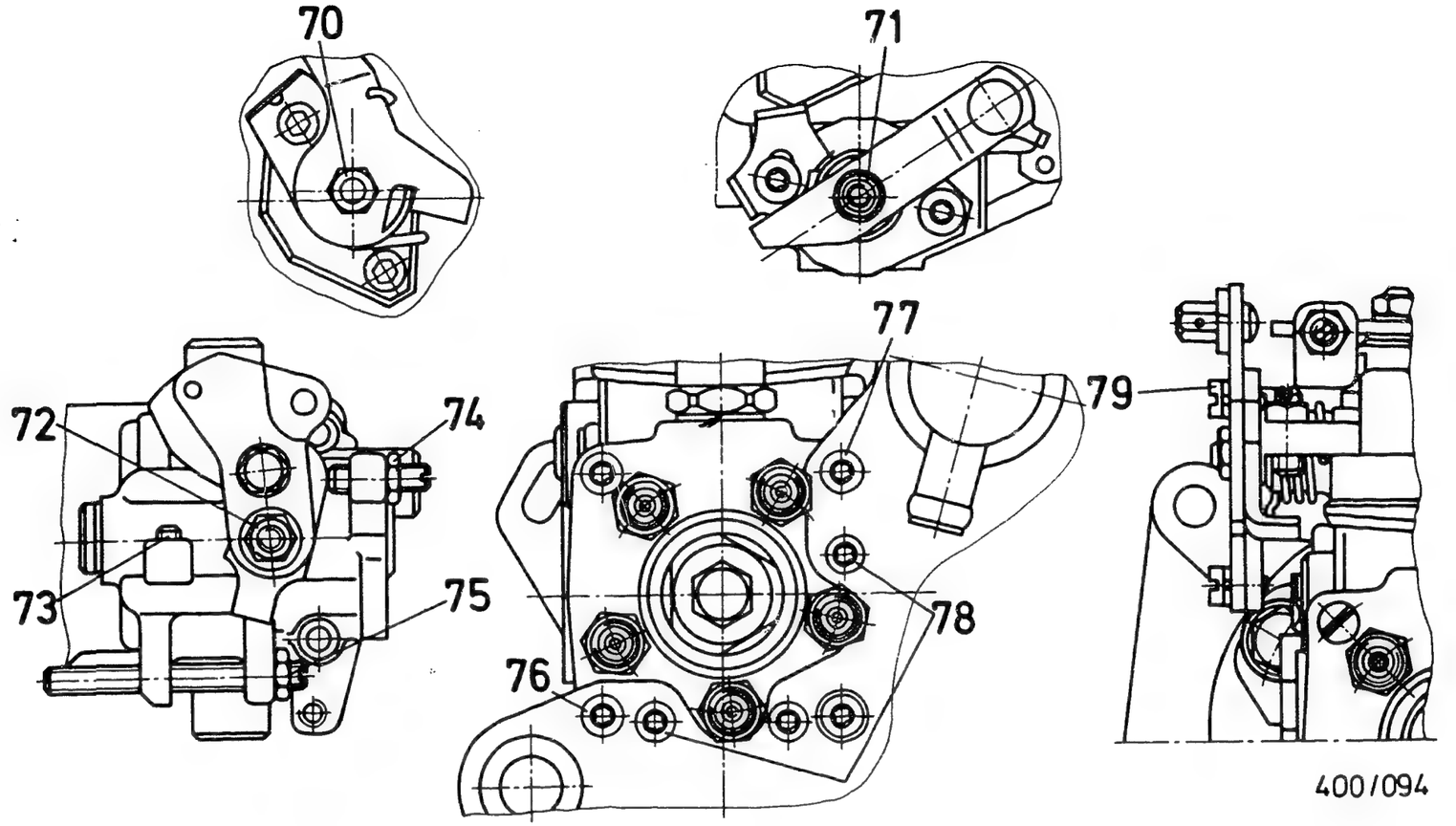


400/093

TIGHTENING TORQUES FOR BOSCH VA.., VE.. DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

Item	Coordinate
61	H22
62	H22
63	H22
64	H22

Item	Coordinate
65	H22
66	H22
67	H22
68	H22
69	H22



400/094

TIGHTENING TORQUES FOR BOSCH VA.., VE.. DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

Item	Coordinate
70	H22
71	H22
72	H22
73	H22
74	H22

Item	Coordinate
75	H22
76	H22
77	H22
78	H22
79	H22

TIGHTENING TORQUES FOR BOSCH-VA.., VE..DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

Item 1 - Delivery-valve holder

Model	Thread	Nm
VA..	M 14 x 1.5	40...45
VE..	M 14 x 1.5	38...42 *
		38...48 **

Item 2 - Bleeder screw 5...8 Nm

Item 3 - Bleeder screw

Model	Thread	Nm
VA	M 6	4... 5
VE	M 8 x 1	26...32

Item 4 - Screw plug

Model	Thread	Nm
VA	M 12 x 1	40...60
	M 14.5 x 2	60...70
VE	M 32 x 1	70...90

Item 5 - Fillister-head screw for distributor head

Model	Thread	Nm
VA	M 6	11...13
VE Hexagon-socket-head cap screw	M 6	7...10
Hexagon-socket-head Torx cap screw	M 6	10...14

* = used delivery-valve holders
** = new delivery-valve holders and new distributor head

TIGHTENING TORQUES FOR BOSCH-VA.., VE..DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

Item 6 - Fillister-head screw

Model	Thread	Nm
VA	M 6	5... 6
VE	M 6	10...14

Item 7 - Fillister-head screw for pointer 2...3 Nm

Item 8 - Fastening screw for cover

Model	Thread	Nm
VA	M 6	5... 6
VE	M 6	6... 9

Item 9 - Flat-head screw for supply pump

Model	Thread	Nm
VA	M 5	4...5.5
VE	M 4	2...4

Item 10 - Slotted round nut 17...22 Nm

Item 11 - Fillister-head screw for cover attachment 7...10 Nm

Item 12 - Fastening nut for control lever

Model	Thread	Nm
VA	M 6	5... 7
VE-all levers except MLD FLD	M 6	5...10

Item 13 - Fastening screw for stop plate 7...10 Nm

Item 14 - Lock nut for stop screw

Model	Thread	Nm
VA	M 6	5... 6
	M 12 x 1	14...18
VE	M 6	7... 9
	M 8 x 1	6... 9

Item 15 - Inlet-union screw

Model	Thread	Nm
VA	M 12 x 1.5	20...25
VE with inlet union	M 12 x 1.5	20...30

Item 16 - Fastening nut 1.5...2.5 Nm

Item 17 - Solenoid-operated valve 15 ... 25 Nm

Item 18 - Slotted shoulder screw 10 ... 15 Nm

Item 19 - Hexagon nut

Part no.	Thread	Nm
2 915 011 011	M 12	60... 70
2 915 021 004	M 14 x 1.5	80...100
2 915 041 106	M 14 x 1.5	60... 70

Item 20 - Tube fitting

Model	Thread	Nm
VA	M 12 x 1.5	40...45
VE	M 12 x 1.5	20...30

Item 21 - Overflow valve 40...60 Nm

Item 22 - Hexagon nut 3... 5 Nm

Item 23 - Pressure regulator

Model	Thread	Nm
VA	M 14 x 1	8... 9
VE	M 14 x 1	7...10

Item 24 - Fillister-head screw 0.5...1 Nm

Item 25 - Hexagon nut 3.5...4.5 Nm

Item 26 - Fillister-head screw 3.0...4.5 Nm

Item 27 - Fillister-head screw 5...8 Nm

Item 28 - Hexagon nut 6...9 Nm

Item 29 - Hexagon nut 3.5...4.5 Nm

Item 30 - Inlet-union screw 10...15 Nm

Item 31 - Fillister-head screw 6...8 Nm

Item 32 - Screw plug 12...16 Nm

Item 33 - Slotted round nut 8...12 Nm

Item 34 - Hexagon nut 25...35 Nm

Item 35 - Hexagon nut 5...10 Nm

TIGHTENING TORQUES FOR BOSCH-VA.., VE..DISTRIBUTOR-TYPE FUEL-INJECTION PUMPS (CONTINUED)

Item 36	Hexagon nut/fillister-head screw	6... 9 Nm
37	Connecting nut (FLD, MLD)	6...10 Nm
38	Hexagon bolt (FLD, MLD)	2.5...4.5 Nm
39	Torx fillister-head screw (MLD)	10.0...14.0 Nm
40	Hexagon bolt	7...10 Nm
41	Hexagon-socket-head cap screw	2... 3 Nm
42	Hexagon bolt	16...24 Nm
43	Hexagon nut	7...10 Nm
44	Round nut	5... 8 Nm
45	Hexagon nut	5... 8 Nm
46	Hexagon bolt	10...15 Nm
47	Hexagon bolt	6... 9 Nm
48	Hexagon-socket-head cap screw	8...10 Nm
49	Fillister-head/Torx screw	10...14 Nm
50	Valve insert	10...15 Nm
51	Inlet-union screw	8...12 Nm
52	Inlet-union screw	8...12 Nm
53	Retaining screw	6...10 Nm
54	Screw plug	12...16 Nm
55	Hexagon-socket-head cap screw	3... 5 Nm
56	Fillister-head screw	5... 8 Nm
57	Hexagon nut	6... 9 Nm

Item 58 - Hexagon nut	3... 5 Nm
Item 59 - Inlet-union screw	8...12 Nm
Item 60 - Inlet-union screw	20...30 Nm
Item 61 - Torx bolt	8...12 Nm
Item 62 - Cheese-head screw	2... 3 Nm
Item 63 - Hexagon nut	50...70 Nm
Item 64 - Hexagon bolt	4... 6 Nm
Item 65 - Hexagon-socket-head cap screw	3... 5 Nm
Item 66 - Hexagon nut	2.5...3.5 Nm
Item 67 - Cheese-head screw	6... 9 Nm
Item 68 - Hexagon nut	5...10 Nm
Item 69 - Cheese-head screw	6... 8 Nm
Item 70 - Hexagon nut	5...10 Nm
Item 71 - Hexagon nut	5...10 Nm
Item 72 - Hexagon nut	6... 9 Nm
Item 73 - Headless setscrew	2... 4 Nm
Item 74 - Hexagon nut	6... 9 Nm
Item 75 - Hexagon nut	6... 9 Nm
Item 76 - Torx bolt	10...14 Nm
Item 77 - Torx bolt	10...14 Nm
Item 78 - Hexagon-socket-head cap screw	7...10 Nm
Item 79 - Cheese-head screw	3... 5 Nm

T A B L E O F C O N T E N T S

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